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An account of eight Kúfic Silver Coins.—By E. THOMAS, Esq. C. S.

During Sir Henry Elliot's late march to Pesháwur, with the camp of the Governor-General, he availed himself of the opportunity to collect such ancient coins and medals as fell in his way, and I was subsequently permitted to examine these acquisitions in detail. The bulk of the collection naturally consisted of either purely local coins or mintages of proximate lands, but among the rest were found several specimens of Central Asian Kúfic Coinages of various dates and kingdoms.

Monies of these classes are comparatively well known in Europe, in consequence of the number of pieces that find their way into our western world, *viâ* Russia, Turkey, &c., as well as from the full illustration these travellers receive from the willing labours of continental Numismatists.

In this country, medals of this description, though often falling into the hands of Coin-collectors, together with more easily legible and more valued specimens—are usually consigned to the space in each cabinet allotted to the class *Ignoti*, or permitted to remain in unhonoured association with the tenants of the miscellaneous drawer.

To remedy in a measure the reproach this state of things involves, and as introductory to the further study of similar classes of coins, I propose to describe briefly such of these pieces as have found a place in Sir H. M. E.'s collection—to offer an illustration of a type of each variety, and to introduce Indian readers to an acquaintance with the

valuable works of Continental Authors, who treat on subjects connected with this section of the Numismatic history of Asia.

From those Antiquaries, who are disposed to view this branch of study as *dry* and unprofitable—from those, who set their hearts upon the well-outlined and classic models of earlier days, I would claim a hearing, on the very valid plea, that of *all* divisions of Numismatic science, the Mediæval Moslem Coins the best fulfil the part of exact historical illustration; dealing in no mere repetition of standard types and emblems, seldom subject to ambiguous interpretation, their well covered surfaces convey in simple words, the precise information most prized by annalists: The name and title of the monarch, the city over which he ruled, and the fixed epoch of his sovereignty.

With this much of preface, I now proceed to give a slight sketch of the various treatises I have before alluded to.

The “*Recensio*” of Professor Fræhn is a most elaborate and comprehensive work printed at St. Petersburg, in 1826, giving oriental transcripts of the coin legends, with descriptions and translations in Latin. The publication is unfortunately wanting in illustrations, which renders it of less value to beginners, but as a Text Book, for those advanced in the art of deciphering Arabic coins, it stands to this time pre-eminent in its branch of the literature of the century.

Its printed contents amount to 743 quarto pages, besides which, it has extensive interpolations of starred repetitions of the regular numerical paging in order to admit of the introduction of a mass of additional matter met with during the course of publication.

The Indices alone are a book in themselves, extending over 70 pages of small type double-columns. But more fully to present to the reader’s comprehension the number and variety of the subjects brought under review, I transcribe an outline of the “*Conspectus Classium.*”

CONSPECTUS CLASSIUM.

Sectio I. Chalifæ primarii seu altioris ordiuis.

Classis I. Chalifæ Umaidæ Orientales.

——— II. Ditto Abbasidæ Baghdadici.

Sectio II. Dynastiæ orto durante Chalifatu ’Abbasidico Baghdadico natæ atque florentes.

Classis III. Varias dynastias simul comprehendens, sunt autem :

A. Chalifæ Umaidæ Hispanici.

- B. Alii Principes Hispaniæ.
 - 1. Chalifa Hamudides.
 - 2. Emirus Murciæ.
- C. Imami Edrisidæ in Mauritaniâ.
- D. Emiri Aghlebidæ.

- Classis IV. Emiri Tahiridæ.
- V. Ditto Soffaridæ.
- VI. Ditto Samanidæ ('Alides, &c.)
- VII. Chani Turkarum Hoei-he in Turkistaniâ.
- VIII. Sultanus Subukteginides.
- IX. Choresmis chahi.
- X. Emirus Buweihidæ.
Princeps Sijarides.
'Alides.
- XI. Emirus 'Okailides.
- XI.A Emir Merwanidæ.
- XII. Sultani Seldschukidæ, Classis A and B.
- XIII. Reges Ortokidæ, A and B.
- XIV. Atabeki, Classis A, B, C and D.
- XIV.A Chalifæ Fatimidæ, B Muwáh'hidi.
- XV. Sultani Aijubidæ, Classis A, B, C.

Sectio III. Dynastæ vel sub vel post occasum Chalifatus 'Abbasi-dici Baghdadici natæ et pars hodieum florentes.

- Classis XVI. Sultani Mamluki, A, B.
- XVII. Ditto Patani. XVII.A Princeps Senbedarius.
- XVIII. Chani Hulaquidæ.
- XIX. Ditto Dschelaïridæ.
- XX. Ditto Dschudschidæ.
- XXI. Girai-Chani.
- XXII. Chani Dschaghataïdæ.
- XXIII. Ditto Scheibanidæ, &c.
- XXIV. Imperatores Baberidæ.
- XXV. Schahi Persiæ Sefidæ.
- XXVI. Sultani 'Osmanidæ.
- XXVII. Scherifi Mauritan, A, B.

Appendix 1. Christiani numos titulis Arabicis Signantes, Classis A, B, C.

Appendix 2. Numi Muhammedani incerti.

Professor Fræhn's miscellaneous Essays, relating to Mediæval Arabic Numismatics, are both numerous and important. Among the rest may be cited

1. *Novæ Symbolæ ad rem Numariam Muhammedanorum, &c.* St. Petersburg, 1819, pp. 47.

2. *Numi Kufici ex variis museis selecti.* St. Petersburg, 1823, pp. 84, 4 plates.

3. *Die Münzen der Chane von ulus Dsehutschi's oder von der Goldenen Horde.* St. Petersburg, 1832, pp. 75, 14 plates.

J. H. Müller's work, "*De numis orientalibus in Numophylacio Gothano asservatis,*" (Gotha, 1826, 4to. pp. 187, and suppl. 1841, pp. 61.) offers, in its first part, a complete Catalogue raisonné of all Kufic Coins previously published, together with the author's own new contributions, embracing the period from A. H. 77 to A. H. 663. The second part contains a continuation of the Mohammedan series down to 1232 A. H.

The compilation is one of much value as a book of reference where necessary, the various subjects are ably handled in detail and the whole undertaking is made complete by copious Indices and Lists of authorities both European and Oriental.

As connected with the general subject, I could cite an elaborate Monographie on the Coins of the Bouides by Lindberg, printed in the *Mém. de la Soc. des Antiq. du Nord* (1844): Some admirable letters published in the *Paris Journal Asiatique* by M. DeSauley, and many miscellaneous contributions of the same nature from time to time put forth in the form of detached letters by M. Soret of Geneva.

Marsden's "*Numismata Orientalia*" (Lond. 1823,) though designated by a late French writer as "*si plein des inexactitudes, si de pourvu de critique,*" (*Rev. Num. Paris*, 1849,) is extremely valuable, in what nearly all continental publications fail in,—the number and perfection of its illustrations.

No. 1.

Hishám bin Abdalmalik. Wásit A. H. 121.

Obv. Area لا اله الا

الله وحده

لا شريك له

Margin. بسم الله ضرب هذا الدرهم بواضع سنة احدى وعشرين ومية

Rev. Area الله احد الله

الصمد لم يلد و

لم يولد ولم يكن

له كفوا احد

Margin. Korán ix. 33, محمد رسول الله ارسله بالهدى ودين الحق، ليظهره على الدين كله ولو كره المشركون

No. 2.

Mahdí. Baghdad, A. H. 162.

Obv. Area, as No. 1.

Margin. بسم الله ضرب هذا الدرهم بمدينة السلام سنة اثنين وستين ومية

Rev. Area محمد رسول

الله صلى الله

عليه وسلم

الخليفة المهدي

Margin. Korán ix. 33.

A second specimen struck at Basrah in A. H. 161, adds the name of محمد below the الخليفة المهدي

No. 3.

*Nóh bin Mansúr Samání (unpublished). Balkh, A. H. 377.

Obv. Area لاله الا

الله وحده

لا شريك له

Margin. بسم الله ضرب هذا الفلوس بدخ سنة سبع وسبعين وثلثمائة

الله

Rev. Area محمد

رسول الله

نوح بن منصور

* As Sir H. M. Elliot's collection does not afford a good specimen of Samání money, I have introduced this example from my own cabinet.

I also subjoin a description of a Samání Coin in Mr. Bayley's collection, which is, as far as I can ascertain, quite new in its type, and in spite of its defective preservation likely to prove of much interest in the unusually prominent association of the name of Nasr bin Ahmed, the founder of the line, with that of the reigning sovereign, Nóh bin Mansúr.

Margin. مما امر به الأمير السيد الملك المنصور ايدة الله

Copper. Nóh bin Mansúr. Balkh, 374, H. ?

Obv. Area a Circle, described within a square.

containing the name of نصرين احمد

Interior Margin. لا اله الا الله وحده لا شريك له نصر من الله

Exterior Margin. الفلس ببلخ سنة اربع وسبعين وثلثمائة
الله

Rev. محمد

رسول الله

الطابع لله

نوح بن منصور

Margin. مما امر به الامير نصر بن احمد [مولى] امير المومنين

See also, Die Münzen, p. 51, Tab. xiv. Fig. 22. Recensio, No. 322, c, p. 585, and Jour. R. A. Soc. London, No. XVIII. p. 301.

No. 4.

Nasr bin Ali *Ailek* (unpublished). Boḡhárá, A. H. 394.

Obv. Area لا اله الا

الله وحده

لا شريك له

ابو علي

Margin. بسم الله ضرب هذا الدرهم ببخارا سنة اربع وتسعين وثلثمائة

Rev. Area بادشاه

محمد رسول الله

القادر بالله نصر الحق خان

الموید العادل ابلک

نصر

Margin. Korán ix. 33.

A second specimen reads, ناصر الحق خان

No. 5.

Jellál-uddín Muhammed Jání beg Khán. Kwáriym, A. H. 743.

Obv. السلطان العادل جاني بك

Rev. ضرب خوارزم في سنة ٧٤٣

Fræhn, pp. 225, 256, &c.

No. 6.

Búyán Kulí Behádur Khán. Kish, A. H. 753.

Obv. Area سكه ؟

لا اله الا

محمد

رسول الله

كش

Margin.—ثلاث [سنة] شعور ؟

Rev. السلطان الاعظم

بويان قلي بهادرخان

خلد الله ملكه

A somewhat similar coin has been engraved in Pl. XXI. Fig. 1, Tom. IX. Mémoires de l'Acad. Imp. des Sciences St. Petersburg. The Russian specimen has the words $\nu\epsilon\varsigma$ سكه كش run in between the lines of the *Kalimah* on the Obverse. It has no marginal inscription. A coin of the monarch is engraved in Pl. XV. Fig. 7. Die Münzen.

No. 7.

Sháh Rokh. Subzwár, A. H. 839.

Obv. Area سبزوár

Margin. السلطان الاعظم شاه رخ بهادر خلد الله ملكه وسلطانه ٨٣٩

Rev. Area لا اله الا الله محمد رسول الله

Margin. ابوبكر عمر عثمان علي

"Class XXIII. of Fræhn Numi Chanorum Scheibanidarum, Dscha-nidarum, &c.

"in universa Bochariâ Magnâ vel in ejus provinciâ aliquâ."

No. 8.

Abdul-Latíf Behádur Khán.

Obv. Area, "The *Kalimah*."

Margin. امير المومنين عمر امير الموم

Rev. الخاقان العادل الملك الكامل عبد اللطيف بهادرخان

خلد الله تعالى ملكه وسلطانه [ضرب] سرموقاده (سمرقند)

Fræhn, p. 439, gives a dated coin of this Khán of the year A. H. 953.

No. 9.

Sháh Morád* (New unpublished.) A. H. 1199 ?

Obv. Area. "The Kalimah." Margin, &c.

الموتضي ابا بكر

Rev. Area—سلط—السلطان ابوالغازي السلطان—

—خلد الله تعالي ملكه وسلطانه ١١٩٩ ؛

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*Notes upon a Tour through the Rájmahal Hills, by Captain WALTER S. SHERWILL, Revenue Surveyor.*

The extensive and hitherto unexplored tract of hilly country, extending from the banks of the Ganges at Sikrigallí, in Latitude  $26^{\circ} 10'$  North, and  $87^{\circ} 50'$  East Longitude, to the boundary of the district of Birabhúm, a distance of seventy miles, and known as the Rájmahal Hills, forms the most north-easterly shoulder or portion of the Vindhya Mountains; which range, extending from near the mouths of the Nerbudda and Taptee rivers in Candeish in Longitude  $73^{\circ} 30'$  and Latitude  $21^{\circ}$ , and after having travelled eight hundred and fifty miles in an east, north-east direction, or quite across India to Sikrigallí, here turns to the south, passes through the districts of Birabhúm, Bardwán, Midnápúr and Cuttaek and eventually merges into the Ghats or Mountains running parallel to the Coromandel Coast.

Although every European proceeding up the Ganges passes immediately under these hills, and although they are only two miles removed from the banks of the river, the hills and their contained valleys are not only unexplored, but it is not even generally known that the hills are inhabited; the general received opinion being that the Rájmahal Hills are an uninhabited jungle; that such is not the case I hope to show, having penetrated into almost every valley and climbed all the principal hills, during the progress of the survey under my charge.

The Hills are inhabited by two distinct races, the Mountaineers or a race living on the summits of the hills and who are, with rare exceptions, never found residing in the valleys; and the Southáls who reside in the valleys. Both these races have distinct languages, neither

\* Sháh Morád was the father of Seyd Emír Haider, see p. 443, Fræhn.

of which are understood by the Hindustáni man, nor are the two languages understood by the two races.

The Southáls are interlopers as will be explained hereafter, the hill men are the original inhabitants, whose history may be summed up as follows.

From the days of the Muḥammadan kings to 1764 A. D. these hill people were the scourge and terror of the neighbouring districts, from whose inhabitants they levied black mail, and when that could not be obtained, armed bands fully equipped with powerful bamboo bows and poisoned arrows, descended from the hills, murdered all who opposed their progress; they pillaged the country far and near, carrying away grain, salt, tobacco, money, cattle and goats, or indeed any thing they could lay their hands upon, and, retreating to their jungly fastnesses where no one dared follow them, defied their victims.

Cases have been known where the zemindars of the plains have, for the sake of inflicting an injury on a neighbouring zemindar with whom they have been on bad terms, invited the hill-men to descend from their hills and plunder his land and crops; the inviting zemindar offering the hill-men a free and safe passage through the plains as far as the spot to be ravaged, but several cases of treachery on the part of the inviting zemindars ending in the death of more than one hill chief, at last broke off all connexion with, and destroyed all confidence between, the hill-men and the zemindars.

This unsatisfactory state of affairs lasted for some years after the British Government had taken charge of Bengal and Behar; and as the constant descents of the hill-men threatened to annihilate the ryots in the neighbourhood of the hills, and as no boats could moor on the southern bank of the Ganges without being robbed, and as the dák runners conveying the mail between Calcutta and Benares were constantly murdered at the foot of the hills, and the wallets robbed of their contents, for in those days the only high road to Benares from Calcutta passed through Rájmahal, Sikrigalli and Telíágarhi, Government at last tried what force would do; troops were sent against the hill-men, but with a very doubtful success; the jungles on the hills being exceedingly dense, there being no roads, no supplies and no chance of the hill-men coming to an open fight, no impression could be made upon them; the Muḥammadans, before the English, had

tried the same plan, but failed ; the hill-men from their thick jungle cover, invariably shooting down with their poisoned arrows the accoutred and hampered soldiers, who had quite enough to do in threading their way over the narrow, steep and stony footpaths, and as every wound inflicted by their terrible arrows was fatal, both the Muḥammadan kings and the British Generals found it a hopeless case attempting to coeree these people.

The Muḥammadans after several failures in the hills, left the hill-men to themselves, punishing them only when caught in the plains ; but the English tried another and a more effectual plan ; a plan that seldom fails to win the most savage heart, and that plan was kindness. Captains Brooke and Browne who had hitherto been their destroyers now tried what kindness would effect ; the hill-men had by this time seen how useless it was trying to carry on their old system of plundering the lowlanders, for whenever they were seen in the plains they were immediately chased and shot by our troops. These two officers invited the chiefs and their dependents male and female to descend from their hills ; whoever attended was feasted, presented with a turban, money, beads or some trifling gifts ; when the hill-men were by these acts of kindness in a measure tamed, a Mr. Cleveland, a young man in the Civil Service, then stationed at Bhágálpur, was deputed to try what he could do with these turbuleut and troublesome people. After a few years' intercourse with these people, amongst whom Mr. Cleveland went unarmed and almost unattended, and after much patience and by distributing presents and giving feasts to hundreds of the hill-men at a time, and by settling small yearly pensions on all the principal chiefs, they relented, gradually gave up their thieving habits, and eventually became the honorary guides of the post and road lying at the foot of the hills ; friends with neighbouring zemindars, and well-wishers of a Government that had treated them with so much kindness. Mr. Cleveland subsequently raised a regiment of archers from amongst their numbers who were eventually entrusted with fire-arms and are now in 1851, as fine a body of soldiers as any in the regular army ; thus Mr. Cleveland, as the Epitaph on his tomb records—

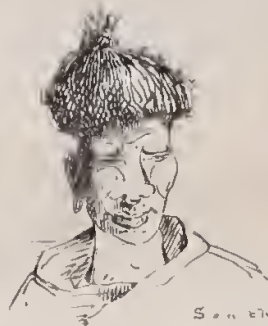
“ Without bloodshed or the terrors of authority, employing only the means of conciliation, confidence, and benevolence, attempted and accomplished, the entire subjection of the lawless and savage inhabi-



Sonthal



Young Sonthal woman



Sonthal



Kosuo



Bhuma



Mudro



Kiswa

Hill men





tants of the jungleterry of Rájamahal, who had long infested the neighbouring lands by their predatory incursions, inspired them with a taste of the arts of civilized life, and attached them to the British Government by a conquest over their minds; the most permanent, as the most rational mode of dominion."

The tomb whence this Epitaph is copied, was erected to the memory of Mr. Cleveland at Bhágalpur, by order of the Governor General and Council of Bengal, in honor of his character and for an example to others; and bears date 1784.

As disputes from time to time still occasionally occurred between the hill-men and the zemindars at the foot of the hills, relative to their proper boundaries and the right of grazing, cutting wood and other matters, Government in the year 1832, deputed Mr. John Petty Ward, of the Civil Service, in company with Captain Tanner as Surveyor, to demarcate a boundary that should secure to the hill-men the undisputed possession of their hilly tract, and effectually separate them from the lowlanders; this, after an immense deal of labour,—for the whole of the boundary demarcated, and which measures two hundred and ninety-five miles in circumference, was entirely through heavy jungle,—was accomplished, and large masonry pillars erected at convenient distances, thus enclosing with the exception of a few outlying hills to the south, the whole of the Rájmahal Hills; all land within the pillars was claimed by Government, and by Government given over to the hill-men to be held by them as long as they behaved themselves in an orderly manner; all without the hills belongs to the various Pargau-náhs of the district Bhágalpur, bordering upon the hills.

All land within the pillars bonâ fide occupied by the hill-men pays no rent or tax to Government; but as the hill-men cannot be induced to cultivate the valleys, nor the extensive tract of level land lying outside the hills but within the masonry pillars and named the Dámin-e-Koh, or skirt of the hills, Government permitted a wandering race of people named Sontháls, whose country extends from Cuttack across Mánbhúm, Chotá Nágpur, Házáribágh, Palámow to Rewáh, to locate themselves upon the land repudiated by the hill-men, paying at the same time a light land tax for the ground so occupied.

In process of time these Sontháls increased in numbers, both by births and immigration, until their numbers became so numerous and

the land that was being cleared of forest and that had been cleared so extensive, that Government appointed Mr. James Pontet of the unco-venanted Civil Service, Superintendent of the whole of the hills, under the Title of "Superintendent of the Dámin-e-Koh," with power to guard the interest of Government by making favorable land settlements with the Sontháls and to collect the rent.

Mr. Pontet took charge of his duties in 1838, the yearly ground rent then being two thousand rupees, and the number of Sonthal villages amounting to about forty, with a population of about three thousand souls; but now in 1851 A. D. only thirteen years after taking charge, Mr. Pontet has, by judicious management, raised the rent to Company's Rupees 43,918-13-5½, and the number of Sontháls who have been induced to immigrate into the valleys and into the Dámin-e-Koh amounts to 82,795 souls, contained in 1,473 villages; 1164 of which pay rent, and 309 of which are free; the latter not having been under occupation the three years of grace considerably allowed to each new village to enable it to clear the forest and break up the land previous to its being brought on the rent-roll.

The boundary of the Dámin-e-Koh as defined by Mr. Ward, encloses an irregular-shaped figure, as it generally follows the shape of the hills; the greatest length from the north to south is seventy miles; the greatest width, which is near the centre of the hills, is thirty miles; whilst to the north and south it is only sixteen miles in width; the area contained within its limits is 1366.01 square miles, of which about 500 square miles are level ground situated within and without the hills.

Of the level ground 254 square miles are cleared of forest; 157 square miles of which are under cultivation by the Sontháls, and 97 square miles are lying fallow.

On the summits and sides of the hills about 28 square miles are under cultivation by the hill-men, and the same area is lying fallow; this allowance gives 20 acres of cultivation and 20 acres of fallow to each village which is the approximately ascertained area.

"The hills" as Dr. Buchanan observes "are no where of sufficient height to reduce the temperature of the air in any considerable degree, and the reflection of the sun's rays from their rocks, and the shelter from the winds that their forests afford, renders the part among the hills hotter than the plains, so that the mountaineers when in the open

country complain much of cold, and the sepoy's of the tribe are uncommonly subject to rheumatism."

In the centre of the hills is a fine level valley 24 miles in length and 5 in width, full particulars of which are recorded in the Journal at the end of these notes; it is drained by a deep nalláh, the Morel or Morung, flowing from the north, and another, the Jamúní or Gúmání, flowing from the south, these two nalláhs unite in the valley, and leave the hills on the eastern boundary.

The Bansui Naddi—a fine broad stream flowing from west to east,—completely intersects the hills by flowing through the Paehwára Pass.

The Brahmaní Nalláh forms the southern boundary of the Dámin-e-Koh. Besides these four streams there are numerous smaller streams flowing from every ravine and valley affording an abundance of pure, fresh water.

To the natives of the plains the climate of the hills during several months of the year is most fatal; jungle fever carrying them off in a few hours; the bad season commences with the westerly winds in March; the suddenness of the attack is appalling, as long as there is no wind the healthiness of December, January, and February is prolonged to March, but the first high wind arising in March is the messenger of death to the natives of the plains; I have seen seven of my servants struck down in one day with fever; the weather had been warm and the air particularly free from agitation; but the day they were taken ill a strong west wind set in and by the evening they had fever.

In the early part of the survey of the hills and from being ignorant of the dangerous nature of the jungle during the month of March, I lost thirty-four natives of the plains who were engaged in the survey; they all died of jungle fever; many others were attacked, but escaped; out of one party consisting of eleven men, seven were taken ill and four died within a few days, they were Muhammadans; two horses that were with the party were also taken ill at the same time and died. The months of April, May and June are also unhealthy for the lowlanders, but September and October are deadly.

With very few exceptions all the natives that recovered from the jungle fever were subsequently sufferers from enlarged spleens.

The hill-men and Sontháls suffer but little from this fever, for when

attacked by it, it assumes a much more mild form and is accompanied by ague.

The soil in and around the hills differs widely in different localities ; the large central valley and spots outside the hills possess a fine black soil, known as the Regur or cotton soil, it is the same soil that is found in the Dekkan, Bundelkund and in the Saugor and Nerbuddah Territories ; I have seen the soil in all the above mentioned localities, where it is always found associated with the same rocks as appear in the Rájmahal hills, viz. Basalt and Laterite. Besides the cotton soil, light colored loams, clayey soils, gravelly and sandy soils also appear.

As on entering the hills the Sonthál is the first class of native that is met with, I proceed to describe him, his manners, and some of his most remarkable customs.

The Sonthál or lowlander is a short well made and active man, quiet, inoffensive and cheerful ; he has the thick lips, high cheek-bones and spread nose of the Bheel, Kole, and other hill tribes of southern and central India ; he is beardless or nearly so ; he is moreover an intelligent, obliging, but timid, creature, very cowardly towards mankind, but brave when confronted with wild animals ; the Sonthál is an industrious cultivator of the soil, and as he is unfettered with caste, he enjoys existence in a far greater degree than does his neighbour the priest-ridden and caste-crushed Hindu.

The Sonthál eats his buffalo-beef, his kids, poultry, pork, or pigeons, enjoys a hearty carouse enlivened with the spirit "Pachúí" and dances with his wives and comrades to express his joy and thankfulness ; and when the more substantial good things of life such as meat and poultry are scarce, he does not refuse to eat snakes, ants, frogs and field-rats.

The cow is also eaten by the Sonthál as well as all other animals, whether slain, or those that have died a natural death, or that have been shot or torn by wild animals.

The women are fat and short and although not pretty according to our European idea of beauty, have a very pleasing expression of countenance, with none of the affected or mock modesty of the Hindu.

The Sonthál is a larger and taller man than the hill-man, and generally stands five feet six inches in height, and weighs about eight stone.

With the exception of the larger villages in the central valley where all the land is highly cultivated, the Sonthál villages are generally

buried in thick jungle, with small cleared patches of ground near the village, bearing crops of rice, Junerá, (Indian corn,) mustard and several kinds of pulse. The villages are composed of upright log huts, with thatched roofs, arranged so as to form a long street one house deep. Almost to every house is attached a pig-stye, or a dove-cot; and bullock or buffalo sheds are distributed throughout the village.

The sides of the street are plentifully planted with the *Sohajná* (*Hyperanthera morunga*) whose mutilated branches proclaim the Sonthál's fondness for its pungent alburnum, which is eaten with their food. Their food consists principally of Junerá (*Sorghum vulgare*), Indian corn, seasoned with the Byre (*Ziziphus jujuba*), chillies, mustard oil, *Sohajná* alburnum, or onions; and accompanied with eggs, poultry and occasionally swine's flesh, goat or kid; the supply of meat depending principally upon the sacrifices. A large white bean as well as the petal and legume of the *Bauhinea variegata* are also used as vegetables.

In every village there is a small thatched roof supported upon one or more wooden posts; the roof gives cover to a small earthen platform raised a foot above the ground; this spot is termed the *Mangi*; at this spot is buried the memory of some former *Mangi* or village-governor, who, for his good conduct, abilities, or for some other good quality, has been, with the unanimous consent of the villagers, canonized; and the spot named after him; thus at *Jhilmilli Bora Mangi* is the name of the village Sanctum. At these spots the head-men of the village meet, talk over the affairs of the village, threaten the unruly, punish the guilty, collect the rents and sometimes make small votive grain offerings to the defunct *Mangi*, which offerings are placed on the ground under the roof, when not occupied by the villagers the holy spot is generally occupied by pigs, dogs or cattle.

In some of these *Mangis* I have seen pots of water fixed on a wooden stand or depending from the roof; their use or meaning I failed to ascertain.

The working dress of the male Sonthál consists of a mere strip of cloth, not passed round the body but being fastened to a hair or cotton string that goes round the loins, it is passed between the legs thus merely hiding his nakedness; the women on the contrary are well clothed with an ample flowing cloth, one end of which is fastened round the waist the other is passed over the left shoulder leaving the

right shoulder, part of the breast and arm entirely free, and is allowed to hang down in front; when the women can afford it, they load their limbs with zinc and bell-metal ornaments; the men wear small zinc earrings, a few finger rings, and occasionally an iron wrist bangle; both male and female tie their long hair into a knot on the crown of the head.

The religion of the Sontháls consists in prayers, sacrifices and religious dances, the whole of which are generally performed and attended to by the votaries whilst in a state of intoxication.

The only prayer I have heard of amongst these people is a supplication to an invisible and powerful spirit for protection from famine and sickness; from disease amongst their cattle; for defence against wild animals, especially the tiger; and that their children may be defended from all dangers, amongst which are enumerated the attacks of wild animals, snake bites, scorpion stings and all kinds of accidents.

This simple prayer points out in a forcible manner the condition of the Sonthál and his wants; he first prays for protection from famine; for as he is an inhabitant of the jungles and generally cut off from all communication with his fellow-men, a failure of his scanty crops would be ruin and starvation to him.

Their plough cattle being the grand instruments by which their crops are insured to them, and as a murrain or a total destruction of these animals would leave the Sonthál in a starving state, his prayers are also directed to their preservation.

That a portion of their supplication should be directed against the attacks of wild animals is not surprising, for the Sonthál being a denizen of the forest as before observed, he is himself as are his cattle in constant danger from the attacks of tigers, bears, leopards, and wolves; and his crops are also in danger from the ravages committed by wild elephants, buffaloes, monkeys and deer, and as the Sonthál never manures his land and as he generally occupies an indifferent soil, a constant change in his abode is necessary, and thus in his onward move, he constantly comes in contact with these his great enemies; the Sonthál however with a proper spirit, does not supplicate without endeavouring to help himself, and no opportunity is allowed to escape of destroying these animals, which is effected with bows and arrows poisoned and not poisoned.







Children being the Sontháls' great pride, comfort and assistance, are not forgotten in their short prayer. Sontháls in general have large families, averaging perhaps eight children to each couple; the male children plough, herd the cattle, reap the harvest, build and repair the family houses, make the carts and ploughs; distil the spirit Páchnú from rice, and perform all out-door work; whilst the female children husk the junerá and rice; express oil from the mustard seed, cook the household food, attend the markets when near one, look after the poultry, pigs, goats, and pigeons; and when the parents are old and infirm the children become their support.

Almost all nations on earth, savage or civilized, appear to have an intuitive feeling or knowledge, that blood is required to be shed for the propitiation of sins; nor do we find the Sonthál ignorant of the fact, and in order to propitiate the invisible spirit they freely sacrifice the buffalo, pig, goat and poultry, the blood of which animals is sprinkled over the offerings made by the worshippers.

Outside every Sonthál village a spot is set apart for offering up sacrifices which are made at all times of the year and by any one having a request to make of the invisible spirit; the spot selected is generally a small patch of Sakua jungle that has been spared when the forest was removed from the neighbourhood of the village, in this secluded grove small stones are set up at the foot of the trees and besmeared with red paint, and generally two upright sticks are stuck in the earth connected by a horizontal one, under or near this group of sticks the victims are slain with a sword, and the blood sprinkled upon the offerings that have been placed under the bar on the ground by the villagers; the offerings consisting of small conical-shaped leaf bowls or cups filled with either rice, junera, or Indian corn, mixed with milk, ghee, spirits or water. The flesh of the victims is eaten by those invited to the feast, which is invariably more or less a scene of debauchery terminating in a wild and most extraordinary dance. A very extensive dance which I witnessed in the hills took place by torch light at midnight during the month of April, at which about five thousand Sontháls were present, these dances are performed both by night and by day; at the present one about four hundred women danced at the same time.

A lofty stage is erected in an open plain upon which a few men

seat themselves, they appear to act as guides or masters of the ceremony ; radiating from this stage which forms the centre of the dance are numerous strings composed of from twenty to thirty women, who holding each other by the waistband, their right shoulder, arm and breast bare, hair highly ornamented with flowers or with bunches of Tussur silk dyed red, dance to the maddest and wildest of music drawn from monkey-skin covered drums, pipes and flutes, and as they dance, their positions -are postures which are most absurd, are guided and prompted by the male musicians who dance in front of and facing the women ; the musicians throw themselves into indecent and most ludicrous positions, shouting and capering and screaming like madmen, and as they have tall peacock feathers tied round their heads and are very drunk the scene is a most extraordinary one. The women chant as they dance and keep very good time in their dancing by beating their heels on the ground, the whole body of dancers take about one hour to complete the circuit of the central stage, as the progressive motion is considerably retarded by a constant retrogressive one. Relays of fresh women are always at hand to relieve the tired ones.

The men swear by the tiger's skin, but swearing them at all is unpardonable, for the truth is by a Southal held sacred, offering in this respect a bright example to their lying neighbours the Bengalis.

The Southals are governed by Pergunnites and by Mangis chosen by themselves from amongst their numbers ; the Pergunnite has charge of perhaps twelve villages, from which he collects the rent and makes it over to the Superintendent, the Mangi has immediate charge of his own village and is answerable for all the misdeeds of his brethren, but as they are in general an orderly race of people their rulers have little more to do than bear their honors and collect the rent.

The Southal will take service with no one, he will perform no work except for himself or for his family and should any attempt be made to coerce him, he flies the country or penetrates into the thickest jungle, where unknown and unsought, he commences clearing a patch of ground and erecting his log hut.

The preliminary step to a Southal's marriage is perhaps as extraordinary a custom as any ever heard of amongst half savages ; it is, that during a certain festival named Bandana, which is held in the month of January and which lasts six days, all the unmarried candidates for



Village trophies and Kill Village



matrimony of both sexes are permitted to have promiscuous intercourse with each other during these six days; at the close of which, the whole party are supposed to have paired off as man and wife; feasting and drinking according to the ability of each couple closing the ceremony.

The Sonthals are very expert with the bow and arrow, so expert that nothing with life is to be found near their villages when of any standing; I have seen the bear fall an easy prey to their well planted arrows, also a hare knocked over when at full speed; birds on the wing I have also seen killed, but with blunt or knobbed arrows; their bows are either made of Dhamin wood or bambus, the string is generally made of bambu or of the fibre of the *Bauhinia scandens*; the arrows are made of a light reed, tipped with barbed iron-heads and feathered with the brown feather from the peacock's wing.

The hill-man is much shorter than the Sonthál, of a much slighter make, is beardless or nearly so, is not of such a cheerful disposition, nor is he so industrious; his great delight appears to be attending the neighbouring markets where decked out with beads and chains, his hair fastidiously combed, oiled and ornamented, he will in company with his friends both male and female, while away the greater part of the day. Labour is the hill-man's abhorrence but necessity compels him to cultivate a small portion of the land for his actual existence; beyond this trifling labour he never exerts himself. He will nevertheless fish, or hunt or roam over miles of the forest searching for honey-combs, wild yams, and other edible roots; he will travel many miles to get a shot at a deer or to secure a peacock, such labour he considers in the light of amusement, but to have to clear away the forest for his crop he considers a great hardship; but clear it he must, and the hill-man generally chooses the most precipitous hill sides as the ground best fitted for his crops. In these spots an iron shod staff or a pointed stick hardened by charring is used instead of the plough—with this implement, holes are made in the soil at the distance of a foot or less from each other, into which are dropped a mixture of the following seeds, Indian corn, juuera, bora beans and the seeds of several small pulses. The tall and robust Indian corn and junera form an ample support to the twining bora bean, which in its turn affords a beneficial shade to the more delicate pulses at its feet.

The heads of the Indian corn when ripe are stocked in bambu granaries of various shapes and which are raised off the ground on posts; whilst those required for immediate use are strung up to the roof of the huts, and as required for food are submitted to the operation of being husked in a wooden mortar; of the meal of this grain a thick and nutritious hasty pudding is made which forms the principal food of the hill people.

The junera is treated in the same way, but the bora bean, kam ruhur and pulses are beaten out either by rubbing with the hand or by beating them on a log of wood.

#### RELIGION OF THE HILL PEOPLE.

For much of the religious history of these people, I am indebted to a paper published in the 4th volume of the Asiatic Researches by Lieutenant Shaw, and dated A. D. 1792.

The religion of the Rájmahal hill people consists in the adoration by prayer of an invisible spirit named Bedo Gosain, who made heaven and earth, and who is invoked by several means and through the medium of various gods, visible and invisible; the visible gods being wooden images, stones and trees, to which may be added heaps of bones and skulls of wild animals; sacrifices and numerous vicariously performed ceremonies being the means of invoking Bedo Gosain.

They inculcate that men should be kind to each other, especially to the poor, and that men should labour for their food, that men should not murder, nor punish without cause, that no one should mock or oppress the poor, the lame, the blind or the unfortunate; adultery and fornication are forbidden, the punishment for disobedience to the commands of Bedo Gosain being either temporal punishment of the souls being condemned to inhabit some portion of the vegetable kingdom for a certain number of years, or to suffer the eternal punishment of being bound and cast into pits filled with fire and maggots.

The self-murderer is expelled from the presence of Bedo Gosain for ever.

The reward for a good life in this world, they believe will be, that after having enjoyed a short but happy residence with Bedo Gosain in heaven, they will be born a second time on earth of woman and that they will be exalted to posts of great honor, possessing an abundance of worldly goods.

The above verdicts for good or evil, are to be pronounced when judgment is held before Bedo Gosain.

They also believe in angels or messengers both good and evil, and that they are the especial messengers of Bedo Gosain. Their officiating priests or oracles are named Demánú; any one fancying the calling appears to take it up, no preparation beyond fasting being requisite to constitute such an official; they foretel events, and threaten the unruly, comfort the afflicted, pray for all, promise blessings to those seeking them, and answer all difficult questions regarding futurity; they kill the sacrifices, regulate the religious dances, feasts, and ceremonies, and lastly they exorcise devils and evil spirits.

*Marriage.*—A man may marry as many wives as he can conveniently manage to support; four wives appearing to be the maximum. A young man having taken a fancy to a young girl of adult age, shows his love for her by an exchange of presents, walking with her, giving her toddy to drink and by sleeping on the same bedstead with her; should any indiscretion arise previous to marriage from the young couple sleeping together, they are considered disgraced and are visited with fine. A few presents to the girl's father, a feast and a sacrifice of a goat or some poultry complete the matrimonial ceremonies.

A man dying and leaving widows, they are, if agreeable to the arrangement, married to their late husband's younger brothers, or cousins, or to any one else they fancy.

Adultery and fornication on the part of either sex is punishable with fine, and the ill effects effaced by sacrifice and feasting.

Witchcraft and sorcery are firmly believed in; the test, as is usual in almost all countries of the world being fire. The suspected person being obliged to pass hot irons over his tongue, hands and feet, and as human flesh must suffer from the contact of red hot-iron, conviction is a matter of course, and gives an opportunity for a sacrifice and the usual accompanying feast.

Upon the birth of a child the mother keeps to her house for five days attended upon by her husband; on the fifth day the child is named by the parents.

The dead are buried.

The men swear by salt.

The whole tribe are without any caste; partaking of all sorts of food even to the flesh of the cow and swine.

The foregoing Introductory Remarks were written as explanatory of the following Journal.

*Journal of a Tour through a portion of the Districts of Moorsheda-bad, Birbhum and the Rájmahal Hills, in the District of Bhagalpur.*

December 12th, 1850.—Left the military Station Berhampur situate on the left bank of the Bhagarutti ; direction south west eight miles to Gow-kurn. Cross the Bhagarutti a little above the Station in ferry-boats. The banks of the river present numerous strata of a grey alluvial soil alternating with strata of white sand ; on the right or western bank saw a stratum of paludina, a fragment of yellow sandstone and old pottery, five feet below the surface of the country. The sand of the river is freely mixed with silvery and black mica, and tourmaline, but no pebbles ; planorbis plentiful on the banks.

The road for six miles is over a deep alluvial soil, lying very low, very damp, and abounding in marshes ; the number of birds seen in this low tract where there is an abundance of insect-life and fish, is very great ; consisting of fishing eagles, crows, ravens, paddy-birds, mohoka, golden oriole, snipe, mina, koel, larks, king-fishers of several kinds, amadavats, crested bulbul's, jacaenas, sparrow-hawks, peewit, plover, king-crow, hoopoe, brahminee kite, storks, kites, snippets, Pharoah's chickens, whistling teal, grey and black partridge, terns, finch, Pondieberry vulture, brown vulture, swallow, pagla, wagtail, bee-eater, woodpecker, blue pigeon, kokleet, doves, jay, heron, cormorants and numerous wild fowls.

At the sixth mile or at the village of Nowgong the country rises suddenly and is undulating, the alluvial soil ceases ; kunkur (nodular limestone) and pisiform iron ore become common ; the colour of the soil changes as well as the feeling, if not the temperature of the air, which is more dry and bracing than at Berhampur, nor is the change of soil less remarkable, as yesterday I thrust a walking stiek eighteen inches into the Berhampur alluvial soil, which same stiek made no impression to-day upon the hard dry soil of Nowgong. Looking east, the low alluvial tract in which Berhampur is situated appears about one hundred feet below Nowgong ; it is to this low marshy country which extends from Rájmahal to Nuddya, a distance of one hundred



and twelve miles, that tradition assigns the former bed of the Ganges before the formation of the Podda or the present Ganges below Rájmahal; and before the existence of the present Bhagarutti. This lowland is at present drained by the Jeeoonthee Nullah which falls into the Bhagarutti a little below Berhampur.

The principal crops of the alluvial soil are rice and mulberry; the latter is cultivated for the use of the worms which produce the Berhampur and Cossimbazar silk.

Principal crop of the higher land is rice; principal trees, Pipul, Burgut, Babul and Nim; bamboos are also common.

A square tank at Gowkurn presents a goodly supply of elegant water-plants, scarlet and white lotus, water-creepers, and numerous handsome water-flowers whose names I am unacquainted with; large ampullaria are common in the tank.

*December 14th.*—Direction west, eight miles to Jamukandi, at the second mile cross the Dwarka, a shallow muddy stream flowing easterly from the Rájmahal Hills, stream barely perceptible; one of the numerous branches of the More river which is one of the drainers of Birbhum and southern pergunahs of Bhagalpur, joins the Dwarka at the ferry, its bed was dry and sandy, the sand composed of grey and white quartz and an abundance of schorl from the gneiss and granite formation of Birbhum, and also iron ore. The Dwarka is sandless with steep banks of a rich loam, at the foot of which lying scattered about were numerous dead specimens of the pearl-bearing unio and palludina.

The pearl-bearing unios are collected from the Jheels and marshes in great numbers, a small proportion only bear pearls, which are of a very good colour and size; a large pair sell for 250 Rupees. The shells are burnt for lime.

After crossing the Dwarka the country is highly cultivated and beautifully wooded; the crops rice, sugar-cane, linseed, mulberry and small patches of wheat. At the several villages the chunderkees or large circular bamboo frames or stands covered with thousands of yellow silk cocoons were drying in the sun.

Jamukandi is a large town on the banks of the branch of the More river that falls into the Dwarka and stands on the common boundary of Moorshedabad and Birbhum, the town boasts of a very

fine and extensive masonry built bazar, ornamented in a fantastic manner by about fifty figures, painted on boards by native artists, as large as life, representing the dress of English females in the reign of George the Second. There are numerous tanks, brick buildings and gardens, besides numerous groves of cocoonut trees swarming with monkeys.

A quantity of steatite plates, bowls, and dishes were being worked up in the bazar that are brought in a rough state from the district of Bancura situate to the south of the Damuda, coal fields on the granite and syenetic formation.

A quantity of the *Morinda tinctoria* (al) is grown at this place, it is used for dyeing the karwa or red cloth used principally in tent-making.

15th December, 1850.—Direction west, 10 miles to Andhi.

After leaving Jamukandi the country rises rapidly all the way to Andhi which is about eighty feet higher than Jamukandi. The whole country passed through this march was under ripe rice cultivation and mulberry and moderately wooded.

In the tanks saw *ampullaria*, *limnea*, *paludina*, *cerithium*, and *succinea*.

#### BANKS OF KUNKUR ARE NUMEROUS.

16th December, 1850.—Direction west, distance ten miles to Synthia situate on the south or right of the More river. Country still rising, highly cultivated and beautifully wooded with mango groves. Synthia is situated on a high gravel bank which forms at this spot the easterly boundary of the great iron beds, which extend many miles both north, west and south from this place.

To the north of the village a good section has been effected by the water of the More in the high gravel bank, which affords the following appearance; on a level with the bed of the river the bank is composed of a very tough arenaceous conglomerate, composed of pink quartz sand connected with a ferruginous cement, capped by a layer several feet thick of a coarse gravel composed of rolled pieces of white and translucent quartz, pisiform iron ore and a few pieces of decomposing felspar, the whole firmly embedded in a ferruginous sand, which is again covered with nodules of kunkur. The bed of the river is in places quite black with magnetic iron dust which clings in clusters to a magnet.

The More is about half a mile across with a small but brisk stream of pure water ; the southern outliers of the Rájmahal hills are visible to the north-west, distant twenty-four miles.

In the village I saw large heaps of coal that had been brought by a zemindar from the Ajye river, distant forty miles, to be used for burning bricks.

17th December, 1850.—Direction west, ten miles to Sury, the civil station and capital town of the district Birbhum. The whole march lay through a highly cultivated and well wooded country.

Sury is a moderate sized native town situate on an extensive ridge of gravel, composed of quartz felspar, silvery mica and a great abundance of pisiform iron ore ; the whole lying upon granite, which is seen cropping out from the gravel one mile north of the station.

As far as the eye can see to the north, the country appears composed of long undulating ridges, running east and west, well wooded and backed by the Rájmahál Hills.

18th December, 1850.—Direction north-west eight miles to Naggulia. As before observed the granite is met with one mile from the station, it has about seventy-five per cent. of felspar in its composition, with translucent quartz and silvery mica. Pass through Ratangarh a small village on the right bank of the More, but which in Arrow-smith's large map is made to appear on the left bank ; at this village I passed under two large kuchla or Strychnos nux vomica trees, whose branches were bending under the weight of large clusters of their tempting orange looking, but deadly poisonous fruit.

Naggulia is situated on the summit of one of the numerous ridges that generally extend throughout the western portion of the district ; they are in general from ten to fifteen miles in length, and from thirty to fifty feet in height ; the valleys between averaging from the crest of one ridge to the crest of another about five miles in width ; the ridges are invariably covered with a forest of sakua trees, a species of shorea, and assan, with naked rocks of quartz, felspar, gneiss, dykes of greenstone, hornstone, occasional actinolite and nodular iron stone, the latter disintegrating, forms the pisiform iron ore so plentifully found spread over the country, and which forms the finest natural roads possible to conceive ; unlike kankar roads which are always liable after continued rain to run into holes from the pounded lime re-crystallizing, these

roads are improved by rain, it being the agent by which the red oxide which is always forming on the surface of the ore by the absorption of oxygen is spread over the incoherent particles, which are soon united into a hard mass.

Three miles in an easterly direction from Naggulia on the left or northern bank of the More River and opposite the village of Kattangá and near a village named Tangsuli, is a small bed of sandstone with minute threads of coal and an abundance of bituminous shale wedged in between gneiss rocks.

Three miles north of Naggulia are two small gneiss hills named Parjore; from the summit of which there is a good view.

*Rajmahal Hills, 16th January, 1851.*—Direction west six miles to Sadipur Buharow. The road is along the right bank of the More River through Sakua Jungle and cultivation; passed some fine Strychnos and soondree trees, from the latter is obtained a bright red dye chiefly used in dyeing wools and silk; the bushes on the banks of the River were laden with *Abrus precatorius*, bearing the pretty red and black bead-like seed. At the second mile crossed the More, a broad river about five hundred yards in width during the rainy season, but now a wilderness of sand with a small but cheerful stream of water.

At Kumardah on the left bank of the river about eighty light boats are built during the year, they are then laden with charcoal and during the rainy season floated down to Cutwa on the Bhagiratti; the charcoal is highly remunerative but the boats merely sell for their prime cost. The presence of steamers on the Ganges and Bhagiratti have much reduced the number of boats that were formerly built at this place. The wood used in building the boats is sal, which is brought from the plains and hills of Tuppeh Belpattá, a few miles to the north-west of the village, that grown on the hills being considered the hardest and most durable.

Immediately after the first heavy fall of rain in June, and after the dangerous bore called the Hurpa has passed down, immense rafts of small timber, fire-wood and bamboos are floated down the river towards the Bhágiratti.

The Hurpa above mentioned is a huge wave caused by a sudden fall of rain in the hills which rushes down the dry bed of the river with a tremendous roar, throwing up in front of itself a cloud of dry sand; natives and cattle are said to be drowned every year by this wave.

Sádirpur is situated on the left bank of the More and opposite to the mouth of the Sidh Nalláh, in the bed of which nalláh and about six miles above its confluence with the More, a bed of coal and a hot spring are reported. I did not visit the spot. The village is immediately under a confused cluster of low and well wooded and bamboo clothed gneiss hills. The gneiss is of a very fine grain with salmon colored felspar which imparts to the rock a cheerful and lively color.

17th January, 1851.—Direction north; ten miles to Bunprassi. At the commencement of the march entered a dense jungle a mile in width under the Kúlang hills, which jungle lies in the beat of a small herd of wild elephants which frequent this part of the country, the herd is said to consist of one male, several females and their young ones. These animals create much alarm in the villages lying along their beat, many of which have been lately deserted on account of the total destruction of the rice fields and in some instances of the huts of the Sonthals, which being probably covered with leguminous or cucurbitaceous creepers have tempted the elephants to tear down and devour their tempting and verdant covering.

The whole march, which was across country, lays along the base of the Belpattá hills through an undulating country with numerous villages, much cultivation and no jungle; a large quantity of Mahúä (*Bassia latifolia*) trees occupy the stony and gravel ridges. The whole country is cut up by ravines, every where displaying vertically arranged gneiss which in spots is highly contorted; a broad dyke of greenstone about one hundred yards broad runs parallel to the hills for six miles or as far as Prasbuni.

A small range of sandstone hills named Rámgarh two or three miles to the east of Prasbuni appear well wooded and in spots cleared for cultivation by the hill-men residing on their summits. Towards the centre of the range a soft greasy white rock is quarried and exported to Calcutta, Moorshedabad and to other places, where it is used for white washing, writing on wooden boards by schoolboys, or for ornamenting pottery and toys.

18th January, 1851.—Direction north-west to Jhilmillee on the left bank of the Brahuaní river; ten miles. Passed through the same sort of country as yesterday, except that upon nearing Pudma the ground becomes much more broken up by ravines, greenstone dykes

and gneiss rocks ; the mahúã trees still giving the landscape a park-like appearance. Passed through several Sonthal villages, in each of which were a profusion of poultry, pigs, buffaloes, cattle and pigeons ; small patches of tobacco and large fields of mustard. Tall castor oil plants surrounded the log huts which are thatched with rice straw.

The Sonthal women, wherever they have an opportunity, pay great respect to the elephant ; I have seen them place their young children on the footsteps of the animal whilst they themselves bowed down to the ground touching the earth with their foreheads. At a village I passed yesterday the women in a large body stopped a very fine and large male elephant that was carrying my tents, and insisted upon rendering him all due honor which they did with much noise and laughter, smearing his noble forehead with vermilion and oil.

From Kurma Tand there is a fine view of the Débrágpur range of carboniferous hills to the north and lying within the Damin-i-koh boundary.

From Kurma Tand the descent to the Brahmini River is very rapid being about a hundred feet in a couple of miles ; large masses of a fine grained gneiss protrude from an iron bound soil.

Crossed the Brahmini River a small stream about one hundred and twenty feet broad, of which only twelve feet was occupied by water, the rest being sand. This river forms the southern boundary to the Damin-i-koh ; on the left bank at the ghaut or ford of which stands a small log bungalow erected by Mr. Pontet who has charge of the Rájmahal Hills.

From Jhilmilli which is a fine Sonthal village, proceeded eastward for six miles to visit the Domanpur coal beds which are exposed in the bed of the Brahmini river. The following is a roughly estimated section of the bed on the northern or left bank of the river.

|                                                                         | Feet. | Inches. |
|-------------------------------------------------------------------------|-------|---------|
| Red Earth, .....                                                        | 24    | 0       |
| Stratum of concentric Iron ore, .....                                   | 1     | 0       |
| Grey Clay which is licked by the cattle, .....                          | 2     | 6       |
| Soft gray sandstone, .....                                              | 1     | 0       |
| Good Coal, .....                                                        | 2     | 6       |
| Purple, blue and waved shale with nests of Iron ore, .....              | 4     | 0       |
| The jungle in the vicinity of the coal consists principally of termina- |       |         |

lias, such as ásan, bahirá and iburra, all of which are burnt for charcoal by the iron smelters belonging to Belpattáh who live within sight of the coal, but who cannot be induced to use it, being afraid as they say of the "Boot" or demons of the forests.

19th January, 1851.—Direction north, four miles, to Kátikúnd. The tract of land passed over is partly cultivated, here and there cut up by ravines but is well populated being studded with Sonthal villages, besides small patches of Asun jungle.

This tract of land bordered by the Brahminée River to the south and west, and by the Irú Nalláli to the north and east, and containing twenty-five square miles is claimed by Sumar Sing, a stipendiary hill chief, residing at Gango, under the Singhi Math hill in Tuppeh Belpattá, he receives ten rupees from Government per mensem although residing outside the Damin Boundary.

It appears that all the Pergunnahs lying contiguous to the hills have lost land, by Government having included the hills within a boundary as pointed out by the Zemindars in 1832, at which period all the land lying immediately under the hills as well as a portion of the outer hills which in reality did belong to the Zemindars and not to the hill-men were covered with an almost impenetrable jungle, and little imagining that the land could or ever would be cleared were careless in defining their boundaries. The Damin-i-koh boundary after a great deal of trouble was settled, the Sonthals from the south were admitted; before whose axes the forest disappeared in a few years; the wild beasts that had been the terror of these hitherto unexplored wilds were soon destroyed by the arrows of the omnivorous Sonthal, the land was sown and being a virgin soil yielded large returns; the Zemindars seeing these facts before their eyes and seeing themselves fairly ousted from their own land, nevertheless by their own consent, for each Zemindar on the boundary signed an agreement as to the correctness of the 1832 boundary, are now beginning to repent of their hastiness in having signed away their land and are endeavouring to recover what can never be theirs again. That the land did belong to the Zemindars there is no doubt, as large masses of the hills are still known by the names of the neighbouring Pergunnahs, and Pergunnah Sultánábád lying on the East of the hills has acknowledged land, about five thousand acres, lying on the Western side of the hills; and the valley known as the

Pachwára pass and now entirely occupied by Sonthals, in former days connected the parent Perguannah with its now detached bantliug.

Káticund is situated upon high ground a few hundred yards from the Iru Naddie; several Bengali grain-dealers live in the village, who buy mustard seed and rice from the Southals, but for a price far below its true value; the grain is exported to Sury.

Near Mr. Pontet's bungalow at Káticund are several heaps of carved stones the remains of an ancient temple; the stones have been brought from the neighbouring northern hills distant about three miles and are of a coarse red sandstone embedding masses of glossy quartz. The sculptures represent what I imagine to be the naked priests or Digambar of the Jains; the carvings are of the rudest workmanship and are very numerous. The carved stones are arranged so as to form two hollow squares of about twelve feet square, and a few feet apart, both of which are covered with thatched roofs and surmounted by Shiva's trident. The Bengalis have established a Brahman to take charge of these groups which together with several Lingams have been dedicated to Shiva and are well smeared with ghee and vermilion. The stones have been originally held together with metal clamps; as the mortises at their angles show, but no trace of the metal appears.

The stoue kallas or series of circles for the summit of the temple are well carved, resembling huge cog-wheels, and are of the same style as those found amongst the rude and ancient ruins on the Mundar Hill in Bhaugalpur; on the Kowa Dhole of Behar and that are so plentifully distributed throughout all the hills of that zillah.

The remains of this temple is the only piece of antiquity in this neighbourhood, and the natives of these parts affirm that in former days this was a populous and well-cultivated country, that it then became overrun with jungle and was deserted, and that it was only beginning to be again populated, cleared and cultivated.

Of the truth or probability of such a change having taken place we have no reason to doubt, for every one who has travelled in India must have seen temples, caves and forts which must have cost much time, labor and expense in their construction, and which in their arrangement and high finish show an amount of intelligence and industry quite wonderful, now given up to the wild hill tribes, or buried in deep jungles.



20th January, 1851.—Direction north-west fourteen miles to Kendweh, on the western side of the hills, and at the entrance of the Pachwára Pass or Valley. The country passed over to-day undulates considerably, and is much broken by ravines, a good road has been cut by Mr. Pontet mostly through a stiff brick red soil; crossed several streams all with rocky bottoms, each affording good sections of the country which is composed of gneiss of great beauty especially that in the Gumrá Naddi. Passed to the west of the Dhannia hill at the foot of which, near a village named Undhasol, is a collection of carved stones similar to those at Káticund and evidently from the same ruined temple. Two miles north-east of the Dhannia hill in the Gumrá Naddi are beds of coal discovered by Mr. Pontet in 1846; two miles north of the same hill and near the Nargunje Bungalow and in the same nalláh are other beds of coal also discovered by Mr. Pontet in 1840.

The view of the Maluágarhi range of sandstone hills to the right of the road is particularly fine, the height above the sea of the trigonometrical point on the summit of the western peak is about 1,500 feet.

From Gowrapuhar village at the foot of Maluágarhi and whence there is an extensive view of the plains of Bháugalpur of the Mundar and Noony hills, the descent to Kendweh is very sudden.

Three miles in an easterly direction from the Kendweh Bungalow, at the village of Burgo on the banks of the Baushie Naddi there is a bed of coal lying upon gneiss.

21st January, 1851.—Direction north twelve miles to Burwá. The road is over very broken and raviney ground; numerous running streams flowing from the hills and a good deal of jungle, the principal trees of which were asun, agye, dhamin and dhow; crossed the Baushie river which flows westward through the Pachwára pass. The road travelled over to-day was cut by Mr. Pontet and passes through numerous Sonthal villages, around which were fine sheets of cultivation, comprising mustárd, gram, cotton and junera, the latter cut and stacked. The views along this march are particularly pleasing, especially near the Bokraban Bungalow which stands on the banks of a small hill stream and buried in a dense jungle in which I observed some very fine sál and semul trees. The numerous pure and gushing

hill streams met with on this march have a most pleasing effect upon the Indian traveller, who is generally doomed to dry water courses and drier roads.

The village of Burwa, where I halted, is under a small gneiss hillock; which together with its small patches of cultivation are buried in a pretty forest.

Observing a tuft of straw tied to a tree in the jungle I enquired of the manji the meaning or use of it, he informed me that whenever a Sonthal is desirous of protecting a patch of jungle from the axes of the villagers, or a patch of grass from being grazed over, or a newly sown field from being trespassed upon, he erects a bamboo in his patch of grass or field, to which is affixed a tuft of straw, or in the case of jungle some prominent and lofty tree has the same prohibitory mark attached, which mark is well understood and strictly observed by all parties interested.

On my arrival at the village, the whole female population came out with their families to see the elephants and white faces. Amongst the party of lookers-on was a very pretty young Sonthal girl, she did not belong to this place but had just arrived on a visit from her own village; and as she recognised many of her old friends she saluted them in the following manner; running up to her newly discovered friend she threw herself down on her knees and laid her head upon the feet of the saluted; who in return stooped down and spreading her two hands over the kneeling girl carried them with the tips of her fingers turned in towards the palm of the hand to her own head, where she held them until the pretty visitor rose from her kneeling position, when they immediately commenced talking, examining each other's bracelets, hair-combs and other ornaments. This graceful salutation was repeated to each female acquaintance in rapid succession. Upon my attempting to sketch a few faces the whole party decamped; the knowledge of the dislike of the Sonthal to have his face drawn I subsequently turned to a good account, as I was always able at any given moment to disperse a crowd that had become troublesome by merely producing a sketch book and pencil; the hill men and women on the contrary will upon being asked throw off their clothes, sit or stand in any posture to have their likenesses taken.

In the afternoon I entered a thick forest of assau and chironji at

the base of the Tatukpara hill, half an hour's sharp climbing by a steep footpath brought me to the summit of the hill ; the hill village of Tatukpara which the year before had stood on the summit of the hill had consequent upon the death of a villager, been removed half way down into the valley. From the old site there is a capital view to the eastward of a fine cultivated valley which has been occupied and cleared by Sonthals ; this valley is backed by a range of hills studded in every direction with hill villages, the sides and tops of the hills cleared and occupied by large sheets of cultivation cleared by the indefatigable hill-men, and cleared in spots where it is barely possible to walk as I had good proof in returning to my tents down by another road. From Tatukpara I counted thirty hill villages perched either on the summits or on the slopes of the hills, whilst the villages of the bashful and quiet Sonthals were seen far down in the secluded valleys ; on this hill there is a fine collection of trees of a very large growth, the principal of which are mango, fan-leaf palm, tamarind, kurm, pipal, al or moringa, ásan and cherouji ; of crops there were the remains of tobacco, Indian corn, junera, bora bean and kahar dall ; the level ground had been ploughed.

The road up the hill was over compact basalt and masses of iron stone overlying gneiss ; a mile to the north the descent from the hill was over sandstone overlying basalt, the sandstone appearing as a small precipice in the middle of a field or cleared space on the hill side, the rock is of a pale color nearly white and of a very fine texture. The basalt which forms a great portion of the southern and central hills appears to have intruded in upon and to have much disturbed the sandstone and coal beds. The field above alluded to was one of the numerous cleared hill sides on which the hill-men produce as good crops as their low-land neighbours, it was so very steep that no one of the party could descend without holding on by the stumps of trees or by the long kirbee stalks, grass or rocks, any loose stone removed from its place rolled to the bottom of the hill.

From the forest at the foot of the hill large quantities of the pear or peal, the delicious little fruit of the *Chironjee sapida*, are collected by the Sonthals and sold to the buniáhs of the plains. This fruit which is dried as a raisin and considered by the rich natives as a great delicacy, sells for eight annas the seer in the Behar and Bhaugalpur

districts ; but the buniähs only give the Sonthal weight for weight in rice for this expensive luxury. A seer of pæar is worth eight annas, a seer of rice is worth one pice, so that only one thirty-second portion of its true value is given to the Sonthal.

22nd January, 1851.—Direction north. Passed a bungalow at Chundná at the second mile, and from thence struck in under the hills through a series of wild jungly ravines, and amongst gneiss hillocks and over greenstone dykes to Sündari Kulan, a fine large Sonthal village situate close under the hills, and surrounded by sheets of mustard cultivation. The village is about one mile in length, being one long street one house deep, with about one hundred family enclosures, each enclosure occupying from four to five log-wood houses. These enclosures are made with the green boughs of the Sakua ; planted in the ground and tied together they keep each family distinct from its neighbours ; they generally contain a Sonthal and his wife ; several married children and their families ; a pig sty, buffalo shed and a dovecot ; a wooden stand holds the water-pots, the water from which is used for drinking or cooking, there is also a rude wooden press for expressing oil from the mustard seed. In a corner of the yard there will probably be a plough, or a couple of solid wheeled carts, whilst numbers of pigs and poultry are seen in every direction. Each of these enclosures contained on an average ten souls thus giving a population of one thousand to Sündari.

The street is planted on each side with the pungent sohajná, which tree is a great favorite with the Sonthal.

The numerous pig-styes and great abundance of poultry in the village, proclaim the absence of caste amongst this free and unshackled and un-priest-ridden tribe.

Close to my tent I witnessed a sample of their religion, as connected with their harvest rejoicings ; it was a wild and extraordinary proceeding, and was as follows. Two men with dishevelled hair and with their heads hanging down as if in the attitude of deep thought, sat under a small shed a few hundred yards from the village ; a drummer was beating furiously upon a Sonthal kettle-drum, who gave an extra thump on his instrument as occasional offerings of grain in small leaf bowls were presented by various Sonthals from the village, to a small stone erected in front of the shed ; when the number of

offerings had reached to about fifty, the two men under the shed, whom I now perceived were shaking as if possessed with a violent ague, commenced shrieking in a horrid manner ; several Southals immediately rushed forward and commenced asking the shaking men numerous questions, which were sometimes answered by words, but oftener by loud screams ; a favorable crisis appeared to have arrived at last as both the men springing up from the ground with the most demoniacal yells and fearful bodily contortions, led out a small black male kid, whose head at one stroke of a sword, one of the mad or possessed men severed from its body ; before the body could fall to the ground the second screamer who held the string that was tied round the kid's neck, rushed forward and caught it in his arms ; lifting it off the ground with his left hand, he grasped the neck with the right hand so as to check the flow of blood from the severed arteries ; he then walked up to the small leaf dishes containing the offerings, withdrew his right hand, and from the spouting arteries filled as many of the cups as the flow of blood would permit ; the body and limbs of the kid writhing and kicking convulsively a great portion of the time.

Having finished this disgusting scene a question was again put by the Mangi of the village to the sacrificer, as to whether the deity was pleased, and whether he was ready for the dance ; the answer was in the affirmative ; upon which, one of the possessed men had a green bamboo placed in his two hands which were raised high in the air over his head, and the word being given by the Mangi to go and call out the villagers to drink and dance in honor of their deity, the man tore away at a furious pace, his hands over his head, screaming in a most horrid manner. The villagers received the summons and repaired male and female to join in the dance which took place at the place of sacrifice.

I subsequently ascertained that the shaking fits betokened excessive thought or contemplation, and that men fast for two, three and even for ten days to bring themselves into a state of half wildness, during which period they are supposed to answer any questions put to them, not through their own power or by their own knowledge, but through the power of the deity possessing them, which in this case appears to have been the spirit of Bora Mangi a deceased and canonized Mangi and formerly a chief amongst them.

Towards evening I revisited the dance and found the whole party very drunk ; I was asked for money for more drink, which I threw to them from my elephant.

In the evening I crossed the Gúmáui nalláh, a deep hill stream, which has cut its bed through contorted gneiss, and ascended the basaltic hill on which is situate the hill village Jolá ; the view to the north and east is very beautiful, every hill appearing capped by a village surrounded by fine mango and fan-leaf palm trees ; much jungle has been cleared away from all the hill sides for the cultivation of junera and Indian corn.

In the village of Jolá I had much difficulty in making any of the women, who seldom understand or speak Hindustáni, comprehend what we wanted ; the men were all out, either hunting, cutting timber, fishing or attending the markets ; after having examined the interior of several houses, a young man at last appeared to whom were presented a few trifles such as German snuff boxes, needles, thread, buttons, beads, bodkins, and lastly a dram of brandy ; this last gift opened his heart and set loose his tongue ; presents were then distributed to the women who now flocked in numbers to the spot where I stood, the presents consisting of bead necklaces, needles and sewing cotton for the women and bright metal buttons of all kinds of gaudy patterns for the children. The young man at my request showed me the interior of his house, and introduced me to his wife, who was busy cooking in the centre of the one room, which constitutes the entire house ; the hill houses in general are very neat, being composed of either matting, hurdle, or thin stieks, sometimes smeared with mud to keep out the wind, the whole supported by stout timbers upon which rests a lofty hogbacked roof with very low eaves ; the doors are in the gables and are protected by verandahs ; the roofs are pitched at a singularly obtuse angle giving great width to the house. The rafters of the present house were covered with heads of Indian corn, junera, and beans ; against one of the mat walls hung a pair of small antlers with four tynes each, serving as brackets for holding bows and arrows, and a few other light articles. A large drum hung in one corner, a fire was burning in the centre of the room, the smoke from which had blackened every rafter, beam, and bamboo in the house, across the hut was slung a grass hammock, in which the hill people

sleep during the rainy and hot seasons; the hammock was twelve feet in length, six feet in width when opened, and was netted; each mesh being a foot in length. I examined the fabric and found it to consist of the fibre of the *Bauhinea scandens*—a small fishing net and creel hung in another corner, for the hill-men descend the hills and fish in the small torrents but they never capture any thing larger than a moderate-sized minnow.

One old woman I observed was afflicted with an enormous goitre.

23rd January, 1851.—Direction north-east eight miles to Dhumatari where there is a bungalow.

Upon leaving Súdari, entered a thick jungle of ásan, and crossed the Gúmáni or Jamuni by a difficult and steep ghaut; the elephants were obliged to break their way through the jungle there being no road; skirted some low gneiss hills through a small village named Manikbaithan to the banks of the Gúmáni, which nalláh we had to cross again; but finding no possibility of getting out of the bed of the nalláh after having with great difficulty got down into it, I travelled down the stream for a short distance, and on the left bank discovered a bed of slaty coal with its associated shales and sand stones; one mile further north of this spot and under the Chuperbhita hill, I found three more beds of coal, both on the right and left banks of the nalláh—oue bed is a few hundred yards from a spirit shop on Mr. Pontet's new road leading into the hills through the Dhumatari or Chuperbhita pass, and where the Domra nalláh falls into the Gúmáni. The best burning coal was that first found; that found immediately to the west of a small Southal village named Morjor is also good.

The existence of this coal has hitherto been unknown, and as the beds are situated in the Chuperbhita pass, and under the hill of the same name, I propose to call them the Chuperbhita coal fields. There is little doubt that this coal is but a continuation of the Burgo, Durbájpur and Harráh coal beds which produce a slaty inferior mineral.

A heap of the coal and shale, the latter highly bituminous, weighing about thirty pounds burnt with a cheerful flame for three hours in the open air; the coal resolved itself into a fine white ash, the shale of course remained unchanged in shape.

All the beds dip to the north-east at a considerable angle, but at one of the beds I noticed the shale and sandstone so disturbed that the strata formed a saddle; the anticlinal line running east and west; the disturbing agent does not appear, but is very probably the neighbouring basalt.

The following section was observed at this spot on the bank of the stream—Red earth,..... 12 feet.

Black bituminous shale alternating with a coarse white sandstone embedding masses of waterworn quartz, . . . . 12 do.

Direction of strata east and west.

The village of Dhamini is surrounded on three sides by flat-topped hills, which are thickly covered with hill villages. To the east is the commencement of the great central valley whose bounding hills to the east are seen five miles distant.

Some very fine saul trees have been preserved by Mr. Pontet near the bungalow, whose grand proportions give an idea of what the forest must have been before the advent of the Sonthals.

In the forest at the foot of the Chuperblhita hill, I saw some very fine and large specimens of the *Mimosa siris*.

During the march, passed over several extensive kuukur (nodular limestone) beds lying upon the almost naked gneiss rocks.

24th January, 1851.—Direction north-east to Burhyte; at starting entered a small patch of asun jungle, at the second mile crossed a small hill torrent in the bed of which a small fragment of a basaltic column was found. The road the whole march was over compact basalt, occasionally decomposing into spherical masses each with a hard ferruginous nucleus. The soil at the fourth mile, becomes darker and at Burhyte it is the regur or cotton soil of the Dekkan. Passed through several fine Sonthal villages, namely, Kusmáh on the banks of the Gúmáui which stands at the ford; Kadnáh, Gopládih, Hindóádih and Sonájori.

Burhyte the capital town of the hills, is a substantial Sonthal village with a large population, and about fifty families of Bengali traders; there is a good bazar, and two markets are held during the week. There is also a tank and Mr. Pontet has planted a plot of ground with potatoes.

Burhyte is situated in the centre of the great valley which extends



twenty-four miles north and south, with an average width of five miles, and is surrounded on every side by hills, through which there are several narrow passes leading into the plains; one pass is to the south-west, the Chuperbhita pass; the second is the Mujhwa or Murcha Ghat to the north-west, or that leading to Bhangalpur; and one the Ghatiári pass, to the immediate east of Burhyte, leading to Rájmahal and Junipur through Kankjole; and a fourth pass to the south-east or the Murgo Ghat, leading through Umbar to Junipur; and a fifth, to the north-east, leading over the hills to Rájmahal; besides these five regular passes through all of which Mr. Pontet has ent good carriage roads there are numerous footpaths leading over and along the hills.

From Burhyte, large quantities of rice, bora beans (*Dolichos catjang*), Indian corn, mustard and several oil seeds are conveyed away in carts by Bengalis to Jangipur, on the Bhágiratti; and in return for these grains, the Sonthals are paid in money, salt, tobacco, beads, or cloth. The soil around Burhyte is the deep black cotton soil, producing luxuriant crops of rice, Indian corn, junera, beans, koorthee, tobacco, gram and mustard.

The united waters of the Gúmáni flowing from the south, the Morel or Morang flowing from the northern portion of the valley, as far as to the very neighbourhood of the Motijharná hill, overhanging the Ganges at Sikrigalli; meet at Burhyte and with a sudden turn to the east leave the hills by the Ghatiári pass, under the name of the Gúmáni Nalláh: which flowing through Kankjole falls into the Ganges near Farru ká thánáh.

The beds of the streams flowing through the valley are of great depth, perhaps thirty feet, but are nevertheless liable to be filled to overflowing, as was the case in 1845; when the Morel overflowed its banks, swamped the whole of the northern portion of the valley, drowning about five hundred head of cattle and forty Sonthals. These floods only occur when very heavy rain falls in the northern hills, and are periodical, happening about once in five years.

This valley viewed from any of the surrounding hills, affords an admirable example of what can be done with natives, when their natural industry and perseverance are guarded and encouraged by kindness. When Mr. Pontet took charge of the hills in 1835, this valley

was a wilderness, inhabited here and there by hill-men, the remainder was overrun with heavy forest, in which wild elephants and tigers were numerous ; but now in 1851 several hundred substantial Sonthal villages with an abundance of cattle, and surrounded by luxuriant crops, occupy the hitherto neglected spot, the hill-men have with a few exceptions retired to the hills, being either unwilling to be near the Sonthal, whom the hill-man despises, or courting that privacy they could not enjoy in a cultivated plain, have yielded up the fertile plain to their more industrious and energetic neighbours.

The smaller valleys leading out of the main or large valley still afford abundant pasturage to large droves of buffaloes, that are driven in from the plains of Bhaugalpur ; the Zemindárs paying the Sonthals five rupees per hundred head of cattle, for the right of depasturing the jungle from the month of December to April.

I met Mr. Pontet this day at Burkyte and in his company attended the Friday market, that was established by him a few years ago. The amount of grain, the produce of the valley, exposed for sale was very great ; numerous carts from Jaugipur on the Bhágiratti were in attendance to convey it away towards Murshedábád, and eventually to Calcutta from whence much of the mustard that is grown in these hills is exported to England.

Besides grain of various kinds, there was a fair display of sugarcane, salt, lac, dammer or rosin, brass pots and bangles, beads, tobacco, sugar, vegetables, chillies, tamarinds and spices ; potatoes, onions, ginger, cotton, thread and cloth, the latter in great abundance.

Two miles north of the village and extending for a mile east and west and immediately under a range of basaltic hills, is a bed of chalcidony, agate balls, cornelian and quartz crystals. The agate and chalcidony affect the hollow globular form, which globes, upon being broken open, display the quartz crystals pointing inwards, some of the crystals are of great beauty, resembling amethysts, being of a bright violet color probably owing to the presence of one of the oxides of manganese. The crystals vary in size from those of a microscopic fineness to several inches in length, and of a corresponding thickness.

The Sonthals have ploughed in amongst this curious collection of natural gems, any one of which would be an ornament to a geologist's cabinet, many of the globes have been fractured, displaying in the sunshine a brilliant assemblage of sparkling crystals.

The agate balls are of all sizes, some only a few ounces in weight, whilst others weigh several hundred pounds.

At the village of Khurwa and underlying this bed of agates is a bed of wacke enclosing small balls of chalcedony and stilbite; the wacke passes into a very beautiful clinkstone, of a homogenous texture of a pale salmon or dove colour, rings under the hammer, is easily broken, and fracture highly conchoidal; it is found in large slabs six and eight feet in length, also in small parallelograms and wedge-like splinters. If this stone could be found in any quantity it would be a highly valuable discovery, as from its natural fracture or stratification, the stone would be highly prized for many domestic purposes.

A quantity of this stone was taken a few years ago to Bháugálpur for the purpose of ornamenting a tank, but at a fearful sacrifice of bullock life; many of which animals belonging to the Sonthals perished from being overloaded; the Sonthals have a bitter recollection of the transaction, as they say they were never remunerated for the loss of their cattle.

*25th January, 1851.*—Went on an elephant with Mr. Pontet five miles in a North Easterly direction, to see a cave which lies in a small valley. Crossed the Gumáni Nullah, flowing to the East over a cultivated country to the entrance of the valley; the scenery about this spot is particularly pleasing, the hills have sufficient height to display the forests growing on their sides and summits to advantage, and the plain is beautifully wooded with large trees, that have escaped being felled by the Sonthals when clearing the forest.

In one of these trees I saw a pair of very large wood-pigeons called by the natives Begum Hurryel; they are unknown in the plains outside the hills.

After a short scramble through jungle and over broken basalt and agate, we arrived at a black wall-like precipice about fifty feet in height, composed of basaltic columns over which a feeble trickle of water spread itself, imparting to the rocks a pitchy hue. High up the rocks two pakur fig trees have taken root, and thrown down from their position, long and elegant rope like roots forty feet in length, whose silvery whiteness contrasts well with the black columns. On the summit of the precipice are some very fine naked armed sterculias, and at the base of the precipice is a cave named Seer Gádi forty feet in length,

twenty in depth, and about five feet six inches in height; the roof of which is composed of the basis of the columns. The cave is dedicated to Mahadewa whose emblem the Lingum, is seen in the cave. The Lingums of which there are a great number, the walls and roof, are besmeared with red lead and ghee; the floors and walls in the vicinity of the Lingums are in a wretched state of filth, from the quantity of goat's blood, which has been sprinked about in every direction; the blood being that of victims offered up by Sonthals, hill-men, and Hindus indiscriminately. The cave is kept by a Bráhmaṇ from Chitowlia in the plains, and clears about one hundred Rupees yearly, the produce of votive offerings, principally presented by the Hindus from the plains.

A small well has been sunk in a mountain torrent close by, for the reception of drinking water.

Immediately at the foot of the precipice stood the half of a handsome agate ball, a foot in diameter, filled with pure water, which falling drop by drop from the columns, afforded the attendant Bráhmaṇ a cool and, as he imagined, a holy beverage.

The basaltic columns are very irregularly crystallized, exceedingly tough and are marked or are indented with numerous and minute broken vesicles.

From the cave we mounted the hill and after a walk of four miles in a southerly direction along the summit, through a very pretty forest and fearful spear grass, we descended at the southern spur over an extensive land-slip that occurred during the great flood of 1845; the Sonthals and hill-men who were with us say, that it descended during the night attended with great noise. The forest is completely rooted up for several hundred yards along the face of the hill, displaying large mounds of red gravel, clay and masses of basalt.

Thermometer 43° Faht. at sunrise.

26th January, 1851.—Thermometer at sunrise 46° Faht. Early this morning Mr. Pontet kindly drove me in his Buggy to Ghutiari, which lies six miles south-east from Burhyte, and is on the eastern side of the hills; to clear which we passed through the Ghutiari Ghaut, which is a good carriage road running between very prettily wooded basaltic hills capped with hill villages. The whole of the drive was through a well cultivated and populated country, and prettily

wooded. A Sonthal although he does clear away the forest in a most masterly style, has the good taste to spare all the useful and ornamental trees when of any decent size, this always imparts a park-like appearance to the Sonthal clearances.

At the village of Khulouna, the Sonthals have dammed up a sluggish stream whose bed has thus become a very deep body of water, abounding in fish, which has attracted numerous fishing eagles, which we saw busy at their avocation. At this same village, Mr. Poutet has planted a large field of potatoes, in the hopes of inducing the Sonthals to take a fancy to the vegetable, and pay some attention to its cultivation, but no persuasion hitherto used, has been forcible enough to induce the Sonthal to give themselves the trouble to raise this crop, which would meet with ready purchasers in the Bengális; they say "We do not want the potatoe."

At this spot is a small Shola swamp (*aschynomene paludosa*) but no one makes any use of this useful water plant; lower Bengal, I imagine, supplying all the wants of the surrounding country.

The Bungalow at Ghutiari is only five miles from the eastern boundary of the hilly tract.

Buffaloes from their superior strength, are preferred by the Sonthals<sup>s</sup> both for agricultural purposes as well as for draught, to the common grey cattle, which latter animals are readily exchanged with the Hindus from the plains, who import buffaloes for that purpose, all the solid wheeled carts if possible are drawn by buffaloes.

The Sonthal in the construction of his solid wheeled cart, and in the mode of loading it, shows an utter contempt or ignorance of all rules of mechanics; the cart consists of two wheels, composed of two or three pieces of wood, each put together so as to form a solid wheel three feet in diameter; these wheels are supported at a distance of four feet apart by a wooden axle, on to which and three feet apart are pegged two long saplings or bamboos fifteen feet in length; these bamboos forming the whole body of the cart are at the other extremity tied together, and attached to the yoke that rests on the buffaloes' necks. The wheels being at one extremity of the poles, and the other end reposing on the buffaloes' necks as a fulcrum, leaves fifteen feet of unsupported length as the body of the cart, on which are imposed heavy burdens of rice, packed in huge and ingeniously made straw

baskets or rather straw rope balls, five feet in diameter, and as the driver almost invariably adds his own weight by standing on the cart, a ruinous and cruel weight is thus thrown upon the necks of the draught animals and upon the body of the cart, which bends and springs under the weight, whilst the wheels which are at the utter extreme of the bamboos are pressed outwards and backwards and seem inclined to fly from their position, which they would do with great force if relieved by their retaining wooden pegs.

When it is intended to convey grass, rice in the ear, or any other crop on these carts, a few sticks are interwoven with the two skeleton longitudinal bamboos, so as to form a temporary retaining body to the cart.

No iron or other metal is ever used in the construction of these carts; wooden pegs and twisted grass string serving all the purposes to which metal is put by a wheelwright.

The plough in like manner is a simple but effectual instrument, consisting of a crooked block of wood, fitted with a still more crooked wooden handle, and a light beam from six to nine feet in length; the share is a small bar of soft iron a foot in length and one inch in width, one end of which is hammered into a wedge-like shape, this is the cutting part, the other or blunt end, is shipped into a groove in the foot of the plough, where with the aid of two small iron clamps laid across the groove to prevent it flying upwards, it is retained by the pressure conveyed to it during its passage through the soil. The deepest furrow ploughed with these instruments is about four inches.

Two buffaloes draw the plough and one man guides it, after the day's work the Sonthal shoulders his plough and walks home.

*27th January, 1851.*—Thermometer 46° at sunrise.

General direction north west, twelve miles. The distance gained this march was only twelve miles, though twenty miles of ground was gone over.

At Burlhyte, crosses the Gumáni river, exposing basalt in its bed; to Kuksi two miles in a northerly direction, over a well cultivated country.

From thence west, over a spur of the low basaltic hills, offshoots from the high Sunjori hills to Telaki, situate in a valley or cul de sac formed by the Sunjori and Mori range of hills. Near the village of Telakee, are two trees situate in a jungle on the banks of a nullah; the

name of the tree I am unacquainted with; one which was of great beauty had a tall straight stem sixty or seventy feet in height, surmounted by an umbrella-shaped arrangement of branches, which projected from the main stem at right angles, half way up the main stem was a similar arrangement of branches; from all the smaller branches and twigs an infinite number of their delicate green pods a foot in length, but not thicker than a quill, hung in festoons, forming an elegant fringe to the lower outline of the foliage. All parts of the tree yield large quantities of a thin white milk, which falls in large drops in quick succession when any pod, leaf or twig is broken. The leaves grow round the branches in circlets of eight leaves, from amongst which spring four delicate stems which in their turn are again surmounted by eight leaves; the leaves are three or four inches in length, narrow and pointed, smooth and very milky; the native or Southal name for the tree is Chutmi, and the milk is used in hydrocele;—none of my up-country servants recognized the tree. I have, since writing the above seen two stunted specimens of the same tree growing near Sooree; they were also called Chutmi by the villagers.

From Telakee ascended the Mori hill, supposed to be the highest hill in the whole of the Rájmahal range. The range at the base is very densely wooded, the soil covered with kunkur. After an ascent of two hours reached Busko, situate in a fine forest of large trees principally asun, kurm, mango, tamarind and dhow, above which is situate the village of Mori.

In a small torrent I saw basaltic columns measuring fifteen feet in circumference being hexagons of two feet six inches each face.

Mori is a large and well populated hill village; several lowlanders were bargaining and bartering with the hill-men, for grain grown on the summit of this range.

The summit of Mori which is about two thousand feet above the sea, is covered with a fine forest principally of kurm, (*Nauclea*) some of which have attained an enormous size, one in particular is well known all over the country, and has been of great use to me during the progress of the survey of the hills as it stands, a prominent landmark visible from most parts of the northern hills. From this tree there is an extensive view of the greater part of the hills as well as a great portion of the plains of Bhágapur.

At the village of Mori, Mesur, Mangi, or chief of the village at my request took me inside his neat house, in one corner of which stood a small bamboo platform, on which were placed several skulls of the barking deer, and two skulls of the four-horned antelope, which had been killed on this hill either by himself or by his ancestors; the skulls must have been of a great age, as they were nearly black with smoke. It is customary to hand these trophies down from father to son, and such is the reverence with which they are regarded that they are worshipped and bowed down to as gods.

I made a present to the Mangi of some money who in return insisted upon loading my servants with bora beans; here as at all the hill villages I was received with the greatest attention, the mangis invariably placing their neat little bedsteads in the shade as a seat not only for myself but for all my attendants.

Two fine young men accompanied me down the hills as guides; we descended the western flank of the Mori peak to Chupri, situate on a lower range of hills; passing through the village I saw a platform perched up in a tree covered with skulls, the only one I could recognize was that of a neelghye; I did not like to disturb the group hidden as it was by leaves, knowing the importance and respect they pay to these strange relics.

The steep descent from Mori to the lower range which was over loose and rolling pieces of basalt was a work of some difficulty to a small female elephant which had accompanied me up the hill, to the utter amazement of the hill-men and women who had never seen such an animal. A long walk of seven miles along the saddle back of a range of hills, during which passed through Suthbera, Dumlee, and Seni, all hill villages and through a deliciously cool and shady forest, I descended the Semi Ghaut at 3 P. M. to the Sonthal village Semi, having been on foot ever since 6 in the morning, and that without food.

The whole route was over compact basalt with occasional masses of iron ore agate, chalcedony and quartz crystals. The only animals seen were large troops of the Sungoor monkey.

I was particularly struck with the enormous size of the Arahurdol (*Cytisus cajan*) that grew upon the hills, each seed being the size of a small bean.



On descending the Semi Ghaut I saw black shale in a small ravine.

28th January, 1851.—Direction west five miles to Hurrah, situate on a bed of coal and surrounded on three sides by hills. The road is through jungle and over very raviney ground; as far as Bumkungaon two miles from the Ghaut, the formation is basalt, decaying into the usual spherical masses, and large quantities of iron ore. In a small nullah a little to the south of the village are basaltic columns; at Lohartumba or four miles from the Ghaut is another group of basaltic columns, and immediately to the west, a coarse ferruginous sandstone appears; and at Hurra large beds of coal appear in a small nullah close to the village. This coal I believe was discovered by Captain Tanner in 1831; in 1850, a shaft was sunk through the beds but a rush of water taking place, the work was abandoned. The coal is of a slaty and inferior kind.

In the evening, walked to the hill village Hurra, where I had an opportunity of inspecting three collections of skulls and bones; two heaps were on the grass roofs of huts, the third, or the mangi's group was on a small wooden stand supported by wooden posts, and contained numerous skulls of the spotted deer, wild hog, porcupine, hare and barking deer.

On the point of one of the spotted deer horns a hen's egg was em-paled.

Some of the pigs at this village were of an enormous size, and of a different breed from the ugly long legged pig of the plains.

29th January, 1851.—Direction north two miles through ravines of sandstone debris, with indications of coal; passed through a gap in the Gundesree sandstone range of hills named Bora Ghaut, where there are again indications of coal, descended the Ghaut, and skirted the base of the hill to the western extremity, which terminates in several peaks of sandstone and iron stone curiously jumbled together; which gave Dr. Buchanan the idea of the spot having been a volcano. The rocks are a heavy ferruginous red sandstone. Iron is smelted at several villages in the neighbourhood. Turned to the north-east and skirted the base of a detached sandstone hill; the northern face of the hill is singularly barren, presenting masses of glaring white sandstone. At Sohunnea, where there is a bungalow, I attended the market at which were several hundred hill-men and women. It is really surprising to

see the torture, for it can fall little short of such an infliction, the Sonthal women put themselves to, in order to, as they imagine, adorn their bodies. Their arms, ancles and throats are each laden with heavy brass or bell metal ornaments. I had a quantity of these ornaments weighed, and found that the bracelets fluctuated from two to four pounds; the anklets four pounds each; and as a fully equipped belle carries two anklets, and perhaps twelve bracelets, and a necklace weighing a pound, the total weight of ornaments carried on her person amounts to *thirty-four pounds of bell metal*; a greater weight than one of our drawing-room belles could well lift. Almost every woman in comfortable circumstances carries twelve pounds weight of brass ornaments upon her person.

The hill-women are much more moderate as far as the heavy metal ornaments are concerned, which would never agree with the frequent trips up and down their steep hills, but as many as twenty strings of bright coloured beads which cover the whole of the throat and breast of the wearer may be seen worn by a market-going woman.

Direction east, five and half miles, over a highly cultivated plain of black cotton soil; passed between two hills composed of sandstone, basalt and iron stone to Meghee, where there is a bungalow. The view of the hills from the bungalow is particularly beautiful, every peak or rise in the hills has a village upon it, surrounded by mango and palm trees; the hill sides are cleared of jungle for several miles for the reception of the rain crops. Meghee is situate immediately in front of the Munjwa pass, through which pass, it is supposed, the Muhammedans invaded Bengal.

Mr. Pontet has planted a garden at Meghee in which are flourishing coffee trees, lemon, casuarina, pine-apples, peas, cauliflowers, beet, mint, carrots and plantains.

30th January, 1851.—Direction north, twelve miles, over a fine cultivated country entirely occupied and tilled by Sonthals, passed through Murroro where there is a bungalow, to one of the boundary pillars, where I pitched my tent.

In the evening, went three and half miles along the boundary in a northerly direction, over a newly cleared country, which three years ago was a dangerous jungle on account of tigers. The zemindars of Munheecaree a neighbouring and contiguous Tuppeh to the Damiu,

alarmed at the Sonthals advent and wholesalc clearance of the jungle, had disputed the boundary which I have settled by cutting a road through the jungle from pillar to pillar a distance of three and a half miles. The crops of Arahur dal and gram growing in the virgin soil are most luxuriant.

From the small basaltic hill Baltok, there is a fine view of the river Ganges, the Colgong granite hills, Pccr Pointee and the country to the north of the Ganges.

A few years ago, the jungle at the foot of Baltok, was the resort of wild elephants which have been exterminated by the hill-men. Their mode of destroying these animals was by placing in their track Indian corn that had been poisoned with the Dakrah root; the Collector of Bhaugulpoor rewarding their success with fifty rupees for each elephant poisoned. The last elephant destroyed in these parts is supposed to have perished about twenty years ago.

31st *January*, 1850.—During the operation of directing the cutting of the jungle along the boundary, I was amused to see a Sonthal pounce upon a large nest of the mata or large biting red ants, that had been brought to the ground by the felling of a large tree, he beat the leafy nest violently in his hands until he had killed the whole hive, and then coolly commenced eating them, offering a pinch to his friends standing by. He said in reply to my question that they were acid, but very good; to the former opiuiion I agree, as upou tasting them I found the taste nearly as sharp as dilute sulphuric acid, having the same unpleasant effect upon the teeth, but to the latter part of the sentence I entirely disagree.

These ants, the dread of travellers in the jungles on account of their pugnaciousness and painful bite, build their nests amongst the leaves of the mango trees, which they agglutinate with a species of web into round hollow balls; the ants are of a pale orange color, half an inch in length with black eyes and are exceedingly numerous, carnivorous and troublesome.

In a house where I once resided on the bauks of the Ganges, I was much troubled with an extensive nest of hornets that had taken up their abode in the thatch immediately over the entrance door: I was recommended by the natives to try the effects of the mata; a nest was accordingly brought and put into the thatch near the nest; as each

hornet arrived and settled, he was immediately seized by the ants, several to each leg, others mounted on his back and in a few seconds and after a violent struggling he fell dead to the ground; but whether stung or bitten to death I could not observe; in a couple of hours the ground was strewn with hundreds of hornets and before the evening the nest was destroyed.

I have seen a full grown chameleon killed in a few minutes by these ferocious insects; the poor creature had been, together with his cage, put in the sun at the foot of a tree, from which the ants descended, attacked the animal, and killed him.

*1st February, 1851.*—Direction north-east six miles to Simuria on the hills, the residence of Kesoo Sirdar, one of the northern stipendiary chiefs. The greater part of the road was through heavy jungle, through which a road had to be cut for the elephants. Passed over several beds of Kunkur lying upon basalt; and in a deep Nullah between two small Sonthal hamlets, Singtee and Simurtola, saw a bed of fresh water limestone common to the basaltic formation. This bed was discovered by Mr. Pontet last year and opened by him; it is a bluish grey rock, filled with minute longitudinal cavities; the strata are much contorted; it effervesces freely with dilute acid.

Ascended the Simuria hill to the village of the same name, by a steep stony road, through jungle; the rock is basalt with masses of iron stone.

The village of Simuria is buried in a fine forest of magnificent *Nau-  
clea* and *Uvaria*, any one of which would be an ornament to a park; the soil on the hills composed of the decomposed basalt and iron stone mixed with decomposed vegetable matter forms a soil highly conducive to the growth of both trees and crops in general.

The view from the summit of these hills, which here form the northern boundary of the range is very extensive, extending to fifty miles north of the Ganges, and on clear days in the rainy and cold weather months, or from August to December, to the snowy range of the *Himálaya*, distant one hundred and eighty miles.

Kesoo Sirdar, who is an elderly man, was most attentive: he introduced me to his wives, (he has four,) to his children and grand-children, who all received presents according to their ages, consisting of money, beads, gilt and glass buttons, a large clasp knife, scissors, empty bot-

tles, gin, gunpowder, shot and soap, the latter article by especial desire of Kesoo.

The old chief took me to the summit of a hill close, by commanding an extensive view of the hills lying to the south. To the south-west the hill, Mandarin Bhaugulpoor, and to the west, the Monghyr hills are visible. On this hill a spot was pointed out, where some missionaries had felled a quantity of the finest trees for the purpose of erecting a house; the spot had, however, been deserted and the missionaries had never returned; old Kesoo mourned over his trees, remarking that although they had been felled in one day, they had taken fifty years to grow.

On a point of the hills immediately overhanging the Ganges, is a masonry platform where Mr. Cleveland used to pitch his tents. It is particularly pleasing to hear one of our countrymen spoken so well of by so large a body of half wild people as Mr. Cleveland is spoken of by the hill-men; his name after a period of sixty-seven years is still remembered with much affection.

*2nd February, 1851.*—Direction east along the top of the hills. In six hours travelled five miles, the road having to be cut the whole way through jungle. Passed through the hill villages Puchrookhee, Boothouna, Pokuria and encamped at Gogi, overhanging a deep dell and overlooking the Ganges; the road very difficult, being much cut up by deep water courses, jungle and loose stones. At Pokuria passed through a stone entrenchment which is here thrown across the road. In the days of the Muhammadan kings, the hill-men were in the habit of murdering all and every emissary sent from the Muhammadans, then in full force at Rájmahal; and this entrenchment which is a low wall of stones extending in a zigzag fashion across the road, was one of their favorite spots of ambush, where the hill archers lay in wait for the messengers or soldiers who were sent into the hills to coerce or otherwise annoy the hill-people. Kesoo Sirdar, who was with me remarked “*We were bad subjects in those days, sir, but Mr. Chibilly (Cleveland) soon put us on friendly terms with all our neighbours.*”

Close to this spot I stopped to examine one of the large creepers so common in these forests; it was a Ghila or *Bauhinia scandens*, its stem on leaving the ground, divided into three separate branches, of about six feet girth each which with their tendrils extended for several

hundred feet in every direction, occupying upwards of *one hundred trees and saplings* as their supports; the main arms extended for about five hundred feet in length and, at two and three hundred feet from the root, were three feet in girth, the edges of the stem scolloped and waved in a remarkable manner.

The forests on the northern hills are very fine, and contain much fine timber; the principal trees are *Cassia fistula* and a tree much resembling it, bearing the same long pod, but the tree yields a thick white milk when bruised; the *Grislea* or *Dhow*; the *Bijeesaul* or *Dalbergia* also called *Sitsaul*, *Puhsar*, and *Sissoo*, the name depending upon the part of the timber mentioned, the color of the wood, and age of the tree; *Dhow* or *Grislea*; *Asun* and *Urjoon*, both *Terminalias*, and *Sakua*, which I take to be a *Shorea*. The *Saul* forests in the northern hill are fast disappearing. The principal crops are Indian corn, *Junera*, *Rajrahur dal*, several small pulse and the *Bora* bean. The summits of all the northern hills are capped with laterite, which has abundant nests of bright red and yellow lithomarge disseminated.

In the jungles were traces of leopards and bears.

*3rd February, 1851.*—Direction south, six miles to *Banghi*. Immediately to the south of *Gogi*, descended by a very steep path over laterite to a lower spur of hills running at right angles to the high range fronting the *Ganges*; just before descending this abrupt height, a beautiful view of the great interior valley presented itself. As the road had to be cut through the forest the whole way, only six miles in four hours were accomplished. The forest on the southern slopes of the northern hills is exceedingly dense, as indeed, are the forests on all the northern hills. The forests traversed this march met completely overhead, affording a delicious shade even at noon. The woods resounded on all sides with the cries of jungle fowl and peacocks. *Boa* constrictors, mouse deer, leopards and various kinds of deer, are found in the secluded nooks of these hills.

The forests at the foot of the hills, are composed of the same kind of trees as noticed yesterday as growing on the summit, except that a few *Saul* trees appear; also a dense underwood of bamboo-grass, reeds, grass and numerous shrubs, amongst which the wild *Jasmin* spreads its branches laden with sweet smelling flowers. In the underwood, I noticed numerous small birds who appeared clothed with down rather

than feathers; they have a white bare rim round the eye, are very familiar or fearless, and very abundant. I have never seen the bird figured in any work of natural history. The golden oriole were also plentiful in the mango trees.

At Nowgachi hill village, which is one of the neatest and cleanest hill residences I have yet met with, are two very grotesque gods carved in a rude manner so as to represent elephants, to which animals they bear but a very faint resemblance. Between these images, which are surmounted by human heads, probably to represent the Máhut, or driver, at certain seasons of the year, goats, buffaloes, pigs and cocks are sacrificed to Bedo Gossain or the great god. A buffalo was tied before the Mangi's door that was to be offered up during the present month.

Fifty young hill-men accompanied me from this village to assist in cutting a road for my elephants which they did with right good will and appeared highly pleased with the occupation. The hill-man is not to be compared with the Sonthal in the use of the axe, the former is awkward and slow compared with the active Sonthal, nearly one-half of whose existence is spent felling trees.

At Merapara, descended the hills to some extensive Sonthal clearings situated on the banks of the Morel hill torrent, which is the principal drainer of the northern hills and flows to the south. The highland overhanging the Ganges and which is about two thousand feet in height sends no streams to the north, with the exception of a small stream which flows from the Motee-jhurna waterfall, situate to the south of Sikreegullee.

The hill-men in my company on coming within sight of the Sonthal clearings, complained bitterly as, indeed, did Kesoo Sirdar at Sunuria, of the encroachments of their lowland neighbours; they said that the Sonthals were occupying all their vallies, were very saucy and would not leave their clearings, alleging that they had received leases from Mr. Pontet and move they would not. The fact is, the hill-men will not cultivate the valleys and do not like to see any one else cultivate them. Mr. Pontet freely invites the hill-men to take the Sonthals' fields and use the land rent-free, but if they will not use the land nor cultivate it, he immediately allows the Sonthals to take possession.

In several spots, the Sonthals have actually got possession of vil-

lages on the hills, so that the hill-men have every reason to fear the encroachments of their neighbours the Sonthals.

At the Sonthal clearing of Nargunjo now a twelvemonth old, it was distressing to see the enormous waste of valuable timber; fine large trees of many feet diameter were prostrate in every direction, hundreds of other still larger trees stood erect, but withered, being too large for the small Sonthal axe to cut entirely through they had been merely girdled, which operation consists of cutting a deep notch of four inches or more in width and depth completely round the tree; in a few months, every leaf falls off and at the end of the year all the smaller branches disappear, next the bark peels off in huge flakes, leaving the main stem standing like a ship's mast and which weathers the storms for many years.

In one field of mustard near Nargunjo, I saw upwards of fifty-five timber trees standing in this naked condition offering a melancholy and curious contrast to the neighbouring green and luxuriant forest, with which the field was entirely enclosed.

In a few years not a tree will be left in these now timber-crowded valleys, almost the whole of the large Sál forests have already perished under the operation of girdling for the production of the resin known as Dammer or Dhoona.

The hills being entirely closed in to the north and as there is no possibility of getting this valuable timber over the hills to the Ganges, which is only a few miles from the forests, averaging from four to twelve miles, the whole of the felled trees will, and are permitted to, rot on the ground.

Amongst the hill-men, who accompanied me this morning I noticed the following diseases; blindness from white film; varicose veins in the calf of the leg; secondary syphilis, and goitre: fever and ague is also common amongst the inhabitants during the months of September and October.

At the foot of the hills, I passed through a great quantity of a hoplike looking bush called by the Sonthals Chapoor. I am unacquainted with its botanical name, or with the names of many to me, unknown plants, and trees, daily met with in these hills.

Rocks passed over to-day were laterite overlying compact basalt.

At Banji, in addition to the Churruk poojah pole which graces, or



disgraces, every Sonthal village of any note, I here found a board armed with sharp nails, on to which the worshippers are tied, the nails piercing their backs, and in this state are swung round as in the Churruk or swing poojah of the Bengális, and from whom I imagine the Sonthal has borrowed the rite and its attendant festival. I also observed a horizontal gymnastic bar used by the athletes of the village during the same festival.

4th February, 1851.—Direction south, ten miles to Burio Bazaar, a fine Sonthal village a mile from the banks of the Morel, or Morung Nullah.

At starting, got upon Mr. Pontet's Rájmahal road which runs mostly through fine timber forest, with extensive Sonthal clearings and numerous villages.

At the fourth mile passed between basaltic hills beautifully wooded to the summits.

At the seventh mile, is an old ruined mud fortification, it is a square, composed of an outer mound of earth measuring a mile and half in circumference; the excavation for the erection of which forms a wet ditch, filled with water, enclosing an inner Fort higher than the neighbouring ground and contains a few brick walls and the remnants of a Hindu temple, which has been completely lifted from its foundations by an enormous Banian tree, that has enveloped the whole building, unroofed it and destroyed the walls; masses of detached masonry suspended in the tree is all that remains of the building.

Both the outer and inner Forts are overrun with jungle, palm-trees, fine forest trees, bamboos, grass and marsh weeds, amongst them I saw the beautiful Jacana upheld by his long and delicate claws hurrying across the floating reeds and grasses.

This Fort was, it is asserted, built by a Khetri Rajah of Munheearie, but when or for what purpose is no longer remembered.

From Burio, it is Mr. Pontet's intention to cut a road over the hills, to the east of the valley, so as to connect Rájmahal, which is only fourteen miles east of Burio, with the valley. This road should engage the attention of the Post Master General at Calcutta, for when once this road is opened, all necessity for conveying the Daks during the rainy season round by Sikreegullee, Peerpointee and Colgong by water, for which purpose three boats with their crews are kept up, will be at

once obviated, as there will be a high and dry road from Rajmahal to Bhaugulpoor, and only four miles of hilly and jungle road in the whole route. The only engineering difficulty is the Morell Nuddie, to the east of Burio, which during the rainy season brings down an immense body of water and a quantity of trees, and although the bed of the Nullah is from twenty-five to thirty feet deep, but very narrow, the water occasionally leaves it and spreads over the country, this, however, only occurs every fifth or sixth year and the water soon runs off again.

Purchased of the Sonthals at this place a quantity of plaited and twisted cow tail hair necklaces, that are worn by both sexes. These ornaments are made by the cow herds whilst herding the cattle, and are of great beauty and delicacy; many handsome necklaces of thirty and forty strands, each strand composed of triple plaited hair were offered for sale for four annas or six pence English money each necklace.

*5th February, 1851.*—Direction south, eleven miles, to Burhyte road the whole way over basalt and black cotton soil producing fine crops of rice, &c. The basalt everywhere resolving by the process of exfoliation into a grey spotted wacké leaving the hard ferruginous globular nuclei scattered about the country.

At Ruksee two miles north of Burhyte, is a spring of cold water issuing in a fine stream from a red gravel bank, composed of pisiform iron ore, and a red clayey soil; the supply of water is seven hundred and twenty gallons per hour, and supplies the village with good water. A few yards to the south is a northern but weaker spring, the water of which is not used.

*6th February, 1851.*—Direction south, ten miles through a rugged country destitute of roads, but well inhabited and well cultivated. The view from the road at Jussiadih, looking over the Burhyte valley back by the well occupied Chuperbhita hills is very pleasing. Ascended and crossed over the basaltic hill Chooklo, passing through a hill village by name Mori, where all the women were clothed no higher than the waist. Descended into the Murgopass to Putwara where there is a hill village, the women of which were in the same costume as at Mokri. The hills to the south of the pass are very high and prettily broken into ravines well wooded, and the summits studded

with hill villages; large patches of cleared land with the Kirbee or stalks of the Indian corn and Junera still standing are seen on all parts of the hills.

The whole of the rocks passed over to-day were compact and earthy basalt.

*7th February, 1851.*—Direction south, eleven miles, to Soornjbara on the right bank of the Thorai Nuddie, one of the drainers of the eastern hills. The country passed over was very broken, and uneven and undulating considerably, exposing naked sheets of basalt. Passed through much tree jungle composed principally of asun, dhow, siris and sakua, and through several fine Southal clearances, especially that of Leeteepara which is situated on high commanding ground.

Soornjbara is also situated on high ground commanding a very extensive view of the hills and of the low-lands at their base.

The weather throughout the day was highly oppressive, although the thermometer in the shade never exceeded 73°. Numerous electric minature whirlwinds were travelling about the country; gentle wind from the east with a few clouds.

A violent thunder-storm occurred at midnight accompanied by heavy rain and high wind from the west, which drove me from my tents, taking refuge in the Bungalow close by.

*8th February, 1851.*—Direction west, about eight miles, through a very heavy forest of sal, sakua, asun and dhow, over broken and raviney ground and low hills to Gowpara, the largest village in the hills; containing about eighty houses and four hundred souls. The village is situated on the summit of a high range of hills which here form the central or largest group. The village is surrounded by neat hurdle fences enclosing tobacco, mustard, plantains, date and palm-trees, and in the centre of the village and around the houses are numerous fine palm trees, tamarind, peepul, mango, jack, clumps of bamboos and plantains; the houses are neat; numerous cattle sheds, pig-sties and well-stocked granaries bespoke plenty and comfort.

My arrival seemed to have struck a panic into the minds of the whole population, for on entering the village I could not find a single soul to speak to; every one had fled to their houses and fastened their doors.

Fortunately a fine old man who was on the roof of his house laying

out tobacco to dry in the sun, and who was ignorant of our arrival was caught; his trepidation at the appearance of myself, servants and elephant was most painful, and not without much persuasion could he be induced to descend from his house for the purpose of showing us the Mangi's residence; a house was pointed out as being that of the Mangi's, but it was, as was every house in the village, closed. I took up my residence in the verandah, where hung bows and poisoned arrows, deer horns, wild boar skulls, pea-fowl eggs and the cocoon of the wild silk or Tusser. The Mangi soon arrived from the jungle, carrying on his shoulder the produce of his morning's work, a log of wood; he was so alarmed at my appearance that he was speechless, but after an hour's persuasion, talking and laughing he gradually thawed, and told me that he had never before seen a white man, nor an elephant, nor had any one individual out of the four hundred inhabitants of his village ever seen one or the other. The ice being now broken, and the reason of his timidity known, I endeavoured to prove to him that a mortal with a white face was not the dreadful creature he imagined; I presented him with an empty bottle, a quantity of beads, gilt buttons, bodkins, ornaments for the women's hair, and told him to assemble all the children of the village; to whom I presented in succession three or four strings of beads and a handful of buttons. I now had the whole village with me and turning round I perceived the Mangi's house doors wide open and about fifteen females old and young standing behind me, into the midst of whom I threw a quantity of the hair ornaments consisting of tufts of Tusser silk, dyed scarlet and tied with black cotton; to the children in the Mangi's house I distributed a quantity of copper money, bargained with the Mangi with a quantity of empty bottles and money for poisoned arrows, bows, and grass hammocks, bade him good-bye and strongly recommended him next time he met a European to be more at his ease and not to be afraid of him, as no one had the most remote idea of doing any harm to any one in the hills; on the contrary, that we were all desirous of seeing so worthy a race happy and contented.

I was amused at the Mangi's repeated question put to me in a most serious tone, as to whether I had of my own free will given him the empty bottle, my first gift to him; upon my assuring him that my gift, a most invaluable one to him, and whence his utter unbelief of my

disinterestedness in the matter, had given me as much pleasure in the making as it had him in the receiving, he seemed partly satisfied, but repeated the question at intervals during my stay at the village.

The men of these central hills tie their hair much more on the back of the head than do the men further north, neither have they the flattened noses nor such thick lips as their northern brethren; neither do they pay that attention to dressing their hair or ornamenting their ears or necks with beads and trinkets which is so striking a feature in the northern tribes; the women in the same manner have scarcely any ornaments, are poorly dressed and untidy in their appearance; their great distance from any market or bazar may in a measure account for the difference of dress.

The Mangi gave me six young men with axes to cut a road through the forest; I started in a northerly direction through the finest sakua jungle I have yet seen in the hills; the trees are all of the very largest growth, affording an abundance of good timber; a few sal and dhow trees are in company with the sakua.

To my right, as the path inclined to the west, I had a high range of thickly wooded hills; to the left a deep valley filled with fine Southal clearings, the road lying along a perfectly level steppe of trap, the decomposition of which has clothed the hills with a jet black soil, highly productive of vegetable life. As usual the forest met over head forming a complete shelter from the sun's rays.

On these hills, I found an abundance of a bulbous root, which I take to be the squill, it is as large as a common onion and intensely bitter; the Southals use it to thicken newly woven cloth, by applying its bitter juice to the surface of the piece.

On the right of our party and far up the hill, a furious drumming and screaming was being carried on, which proved to be a party of hill-men driving from the neighbourhood a leopard that had been annoying their cattle.

In the thickest parts of the jungle, I fell in with several places of worship as used by the hill-men; the spots are generally occupied by two upright posts supporting a horizontal one. On the latter were threaded so to speak, several old baskets, calabashes, earthen pots, rings of date leaf, an old wooden mortar without a bottom, bundles of leaves tied up like a porter's knot, bamboo winnowing baskets and

string hammocks; at another "Gosainthan" as these spots are called, I found the horizontal pole supporting numerous bamboo bows and arrows, battle-axes made of bamboo with date leaf blades, and numerous date leaf rings; at a small distance removed and laid in the foot path, were several small earthen-ware cups filled with blood mixed with spirit, and near the cups was a bundle of staves and bamboos such as are used by the hill-men when walking. The whole of these articles are offerings made to Bedo Gossain either as votive offerings, for expected or hoped-for blessings, or as offerings of thankfulness for benefits received.

At sunset, I ascended the Sendgursa hill by a very steep ascent, from the summit of which I had the finest view of coup d'œil yet obtained of the hills; the hill is about two thousand feet above the sea, and from its summit I could see the following remarkable landmarks; the Monghyr hills to the north-west, distant eighty miles, with a G. T. S.\* on the hill Maruk: the G. T. S. Mundar hill in Bhágalpur half way, or forty miles distant. The Ganges at Bhágalpur, distant sixty miles in N. N. W. direction; the long reach of the Ganges extending to Rampur Bauliah, seventy miles in an E. S. E. direction; the whole of the country lying between the foot of the hills and the military station Berhampoor on the Bhagretti, extending over fifty miles. To the south G. T. S. on the Satbor hill in Belputta, distant forty miles appeared topping the whole of the Katicoond carboniferous range. To the W. S. W. distant fifty miles the Teur hill another G. T. S. and all the small detached hills of Beerbhoom, as well as the hills of Hendweh and Pusseje appeared, amongst the latter are the Nugwan and Puchpuhar hills both G. T. S. In a S. W. direction, the great Parusnath mountain is visible, distant one hundred miles. This mountain, in height nearly five thousand feet, has a G. T. S. on its summit and forms the culminating point of the rocks of the great primitive plateau extending from Beerbhoom to the Duwali Ghaut.

To the S. S. W. the view extends over the Burdwan coal fields; and to the S. S. E. over the whole of the eastern portions of Beerbhoom and Burdwan; with the whole of the southern Rájmahal hills and surrounding forests, as a foreground, whilst the view of the hills

\* G. T. S. Great Trigonometrical Survey Station.

at my feet was most complete, I could see into every valley, count every village and trace the outlines of the hills and valleys.

Descended the Sendgursa hill and ascended the Sootlec hill to Busko, a small hill village, from whence I was enabled to examine a deep valley to the north-east. The summit of the Sootlee hill is composed of laterite, highly sonorous when struck; the noise of the foot-falls of my party walking along sounded, like a body of men passing over a drawbridge, and I noticed that the naked foot produced a much louder sound than was produced by those wearing shoes. I attribute this sound to the cellular nature of the rock and to the thin stratum of earth covering it; this sonorous rock lasted for a mile, the notes ascending and descending a whole octave according to the nature of the rock below.

Slept in a hut at the village of Balkumi to the north of the Sendgursa hill.

As sunset drew near the air was filled by a vast flight of the winged white ants (termes) which took their flight from numerous orifices in the ground, close to the hut in which I had taken up my quarters.

These flights generally take place during the rainy season or in August and September; they are the females who having arrived at perfection, leave home to seek a nest of their own, where they become the queen ant.

Out of the myriads that go forth to seek their fortune, a very small proportion can ever reach their destination, as every bird and beast in the creation appears to devour them with avidity. At my feet a hill-dog was eating the insects by hundreds as they crawled from the earth; the bats had left the shelter of the palm trees and were attacking them; as also were a numerous flock of Minas, who although they had betaken themselves to roost nevertheless left their trees and made a feast off these delicious insects. Cattle, horses, kites, crows, deer, sheep and goats, and indeed, almost every animal, devour this all-destroying insect, who in return, as every one in India well knows to his cost, spares nothing inanimate during its wingless state.

9th February, 1851.—Direction south. Descended by the same steep ascent of yesterday to Dangapara, in a deeply wooded valley in which the pea-fowl were very numerous and noisy.

Travelled twelve miles in a southerly direction through a deep val-

ley full of Sonthal villages to Umrapara, on the banks of the Banslooee Nuddie.

At the sixth mile or near Domuraheer, passed over a flooring composed of the heads of basaltic columns. The rock throughout this long valley affects the columnar shape and in the Ekri nullah which drains the valley, masses of basalt are to be seen that have assumed a cylindrical shape measuring twelve feet in circumference.

10th February, 1851.—Immediately to the east of the Bungalow at Umrapara, the bed of the Banslooee Nuddie is crossed by a broad belt of basalt, causing a fall in the stream of about twelve feet; the basalt is thickly disseminated with nests of radiated, acicular and tabulated zeolite. The acicular specimens are of great beauty, some of the nests measuring four inches in length, with crystals of a microscopic fineness half an inch in length; the flat or stilbite specimens appear in large flat plates of a pearly lustre exceedingly soft, yielding to the nail; the basalt is of a dark green approaching to black, is very tough and heavy, has a sharp angular fracture and is highly magnetic. The rocks from the action of the water are worn into deep smooth cups, varying from the size of a tea-cup to that of a large cauldron.

In the centre of the nullah, below the falls and detached from the general mass of rocks, over which the water spreads, is a group of colossal basaltic columns; one of a pentagonal form I found by measurement to be forty-eight feet in circumference. The columns are free from zeolite.

From Umrapara, direction south, eight miles, I visited the Doobrajpoor and Gopeekandur coal beds. The coal is found in the Tircultia or Tirputtee nullah which flows in a valley between sandstone hills, and near the two Sonthal villages above mentioned. The coal which forms the bed of the stream for about half a mile at Doobrajpoor is slaty and good for nothing, what may be below it remains to be seen.

The following is a vertical section through the bank of the Tircultia, down to the water level.

|                                      | Feet | Inches. |
|--------------------------------------|------|---------|
| Dark coloured earth, . . . . .       | 2    | 6       |
| Slaty coal, . . . . .                | 1    | 8       |
| Sand with threads of coal, . . . . . | 3    | 6       |
| Slaty coal, . . . . .                | 1    | 2       |
| Sandstone, . . . . .                 | „    | „       |



Another Section gives :

|                                        |   |                  |
|----------------------------------------|---|------------------|
| A friable carbonaceous soil, . . . . . | 2 | 6                |
| Sandstone, . . . . .                   | „ | 5                |
| Slaty coal, . . . . .                  | 3 | „                |
| Friable grey sandstone, . . . . .      | „ | 4                |
| Slaty coal, . . . . .                  | 1 | 6                |
| Tough ferruginous sandstone, . . . . . | „ | 5                |
| Slaty coal, . . . . .                  | 2 | 6 bed of nullah. |

Dip of strata, east. Strike, north and south. Between Umrápára and Doobrajpoor the rocks are sandstone with occasional beds of intruded basalt which enclose beds of zeolite.

In the valley known as the Puchwara pass a quantity of iron is smelted by a race named Nyas and exported to the plains or sold to the hill-men and Southals, after having been manufactured into coarse hatchets, plough shares and arrow heads.

At Selunji, where there is a bungalow, and in the bed of the Banslooee, the gneiss with its accompanying dykes of greenstone, have been laid bare by the action of the water of the river ; and to the north of the river about a mile distant coal with shale and sandstone is found overlying these hypogene rocks. Coal is also found midway through the valley in a small nullah immediately to the south-east of the Koonda hill, and one mile west of the village of Puchwara ; I have marked the spot on my map of the hills in the hope that some one having the leisure may visit the spot.

11th February, 1851.—Direction south, thirteen miles to Karodih, where there is a bungalow on the banks of the Tirputtee nullah, that flows over the Doobrajpoor coal beds, seven miles west from the Bungalow.

The whole of the march was over broken raviney and hilly ground, without roads. After crossing the Banslooee nullah, the footpath runs through a forest of dhow and sterculia, the ground strewn with agate and quartz crystals ; nests of the latter are seen adhering to and embedded in a dark-coloured and tough basalt. At the ford of the river, stands a very handsome tree with dark foliage, the name of which I am unacquainted with ; the natives call it kunda or grung, it bears a handsome globular pod containing two seeds, which when ripe are of a scarlet colour, from which is expressed an oil used for anointing cattle, and not human beings.

The pod when unripe is highly aromatic and milky. At the seventh mile passed over a bed of red and grey sandstone, one mile in width, which has escaped being overlaid by the neighbouring basalt, and which has been cut into by the action of the water of a small hill stream; it is the common coarse sandstone which is found in company with the coal at Doobrajpoor and of which bed it is an outcrop.

Passed under the small basaltic hill Kalipuhar, on which stands one of the masonry pillars demarcating the Damin-i-koh boundary. The hills about Karodih are low, round-backed and well wooded.

12th February, 1851.—Direction south-west six miles; over basalt for the first four miles; at the fourth mile sandstone is met with at the entrance of a prettily wooded valley flanked by low hills. Crossed the sandstone hills to Saltaha where there is a bungalow, on the banks of a hill torrent.

A heavy fog obscured the landscape during the greater part of the march. The basalt passed over this day was of a pale grey colour, embedding agate and chalcedony balls; and sometimes appearing as large slabs or floors of rock, at other spots as exfoliating into spherical masses. In the nullah south of the bungalow, the water has laid bare a flooring or mass of sandstone one foot in thickness, the whole divided into right-angled parallelograms of two feet in length by one foot in width. The regularity of the divisions and uniformity of the angles are very remarkable, both of which I imagine are the effects of desiccation. The sandstone overlies a soft friable white clay, and observing traces of coal in it, Mr. Pontet, whom I again met at this spot, at my requisition sent off a Sonthal up the nullah to look out for coal. He returned in the afternoon bringing specimens of a slaty coal which burnt very well. In the evening went to the spot, which is on the right bank of the nullah one mile south by east of the Sonthal village Chicheroo.

|                                                 | Feet. | Inches. |
|-------------------------------------------------|-------|---------|
| The section in the banks shows earth, . . . . . | 3     | ,,      |
| Sandstone, . . . . .                            | 9     | ,,      |
| Slaty coal and shale, . . . . .                 | ,,    | ,,      |

13th February, 1851.—Direction five miles south-east to Moosuria bungalow, on the left bank of the Brahminee river. The road winds prettily under low basaltic hills, the lowland being sandstone and

shale, much disturbed by the intruding basalt. At Moosuria, half a mile north of the bungalow, coal crops out of the left bank of the Brahminey in several spots, as well as on the opposite or right bank.

The rocks in the river are sandstone, three feet thick overlying clay and shale. The former rock has been extensively quarried, but in a most expensive and curious manner; deep tank-like excavations have been made in the solid rock, instead of going to the exposed edge of the rock to procure slabs and blocks for millstones, which in former days were taken down the river to Bellia Narainpoor, a fine village belonging to Moorshedabad, and situate on the right bank, eight miles from the quarry.

In the evening marched along the banks of the Brahminey to Bellia Narainpoor. At Singhpoor, or at the sixth mile, the river dashes over a bed of basaltic columns of great extent, causing a fall in the stream of about eight or ten feet. To the west where the rock first appears, it is a waved floor of basalt having all the appearance of having but lately been poured out in a liquid state over the bed of the river; a little further east it becomes columnar; the columns being vertical or at right angles to the cooling surface; each column measuring four feet in circumference; further east the rock again becomes a solid mass, embedded in which are numerous large and small nests of elegant quartz crystals, and agate balls; the former of great beauty. Masses of pink felspar are also embedded in the basalt. The whole bed which crosses the river at right angles is about a quarter of a mile broad and is entirely free from sand. In one part of the columnar group the protruding heads of the columns have been by the united action of the atmosphere and running water worn into globes, all the angles of the polygons having disappeared, spaces have been left between the columns, and thus the ground is covered by round balls the size of bee-hives giving a curious appearance to the whole group.

*14th February, 1851.*—A few miles south of Bellia Narainpoor, the basalt ceases and is replaced by an extensive bed of nodular iron-stone which extends for thirty miles north and south, and about fifteen miles east and west; this bed of iron ore gives occupation to many hundred forges the produce of which is exported to Moorshedabad, all the neighbouring towns, and to Calcutta.

This extensive iron bed overlies granite and gneiss, both of which

rocks occasionally protrude through it; associated with the iron-stone are patches of ferruginous sandstone, various coloured clays, and actinolite.

*List of Coal localities situated within the Damin-i-koh or Rájmahal Hills—as known in 1851.*

| No. | Description of locality.                                                                                                                                                                                                                                     | Discoverer's name.                     |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 1.  | In the Brahminee river, at Moosuria; which river forms the southern boundary of the Damin-i-koh. This coal extends to an unknown distance into Tuppeh Belputtah. An indifferent coal.                                                                        | Mr. Pontet, 1838.                      |
| 2.  | In the Brahminee river, three miles north-west of No. 1, and one mile east of Domunpoor. This is an excellent coal.                                                                                                                                          | Mr. Pontet, 1838.                      |
| 3.  | Three miles north of No. 2, are traces of coal in a small nullah, half a mile south of Chichroo.                                                                                                                                                             | Mr. Pontet and Captain Sherwill, 1851. |
| 4.  | Seven miles north of No. 3, are the extensive beds of the Gopikandur and Doobrajpoor valley. The coal hitherto produced is a bituminous slaty mineral.                                                                                                       | Mr. Pontet, 1841.                      |
| 5.  | Four miles south-west in a small nullah (under the Dhunnia Puharee hill) which falls into the Goomra nullah is a bed of coal.                                                                                                                                | Mr. Pontet, 1841.                      |
| 6.  | Two miles north of No. 5, and half a mile north of the Nargunjo bungalow, in a nullah is a bed of coal.                                                                                                                                                      | Mr. Pontet, 1841.                      |
| 7.  | Situated immediately at the eastern foot of the Koondapuhar hill, which is one mile removed from the southern or right bank of the Bansbooe Nuddie, which flows through the Puchwara pass, and one mile west from the village of Mudhobun, is a bed of coal. | Captain Sherwill, 1851.                |
| 8.  | At the western entrance of the Puchwara pass, at the village of Burgo, and on the left bank of the Bansbooe nullah, is a coal bed.                                                                                                                           | Mr. Pontet, 1844.                      |

| No. | Description of locality.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Discoverer's name.      |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 9.  | One mile due north from No. 8, situate in an enclosed valley, is a coal bed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Mr. Pontet, 1844.       |
| 10. | At the entrance to the hills on the western flank by the Chuperbita pass, and under the lofty spur of a hill of the same name, and in the bed of the Goomani or Jumoonce nullah, are three beds of coal extending to a distance of two miles, and one mile further north-east are traces of coal in the same nullah.                                                                                                                                                                                                                                                                                               | Captain Sherwill, 1851. |
| 11. | North sixteen miles, of No. 10, and twenty-four miles south of the Ganges, is the great Hurrah basin, with several outcrops of a slaty coal, associated with and underlying columnar basalt.                                                                                                                                                                                                                                                                                                                                                                                                                       | Captain Tanner, 1831.   |
| 12. | At the Bora Ghaut on the Gundaisree hill, which forms the northern boundary to the Hurrah basiu, are traces of coal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Captain Tanner, 1831.   |
| 13. | <p>At the Motee Jhurna waterfall, overhanging Sikreegullee on the Ganges, are traces of coal, but in small quantities. The coal appears to have been charred and disturbed by the basalt, in the heart of which igneous rock the coal in several instances appears enclosed in detached nests, twelve feet in length.</p> <p>A large Rhinoceros looking fossil skull is seen embedded in the basalt.</p> <p>The summit of the hill, from whence the small stream forming the waterfall at this spot flows, is composed of basaltic columns resting on non-columnar basalt which latter rock envelops the coal.</p> | Captain Tanner, 1831.   |

N. B. There is an untraced bed of fresh-water limestone in the northern portion of the hills, four miles south of the Teleeaghurhee Fort; and situated between the two small hamlets, Gurytee and Simurtollah.

## Population return of the Rájmahal Hills or Damin-í-koh for the year 1851.

| Names of Tribe.                           | Local Divisions.                                                                                                                                                                                  | Number of Villages.                                 | Number of Houses.                                   | Number of inhabitants, allowing 5 per house.                                       | Remarks.                                                                                         |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Mal or Maler.<br>The Rájmahal Hill Tribe. | Rájmahal Hills.                                                                                                                                                                                   | 921                                                 | 6,756                                               | 33,780                                                                             | This race inhabits the summits of the Hills only, and pay no taxes or ground rent to Government. |
| Sonthals.                                 | Thannahs.<br>1 Rájmahal, .....<br>2 Diggee, .....<br>3 Hurhurreea, .....<br>4 Doomka, .....<br>Scattered in the above 4 Thannahs and not paying rent; not having been occupied three years, ..... | 385<br>294<br>181<br>304<br>Paying-rent. }<br>1,164 | 4,185<br>3,823<br>2,127<br>3,027<br>16,653<br>3,493 | 83,265                                                                             | This race inhabits the valleys and lowlands and pay a ground rent to Government.                 |
|                                           | Grand Total,.....                                                                                                                                                                                 | 2,394                                               | 23,409                                              | 117,045 or 103 souls per square mile area; Hilly tract being 1366.01 square miles. |                                                                                                  |

*Statement showing the amount of Cultivation, Fallow and Waste Land in the Damin-i-koh or the Rájmahal Hills, for the year 1851.*

| Names of Tribes.           | Acres under Cultivation and Fallow. | Square Miles. | Square miles, being within the Damin-i-koh boundary, which are occupied by Hills and uncleared forest, but which are cultivarabic. | Total area of the Damin-i-koh, in square miles. | Remarks.                                                                                                                |
|----------------------------|-------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Mal or Hill Tribe, . . . . | 35,840                              | 56            | . . . .                                                                                                                            | . . . .                                         | The whole of this cleared land is on the Hills.                                                                         |
| . . . .                    | . . . .                             | . . . .       | 1056.01                                                                                                                            | 1366.10                                         | . . . .                                                                                                                 |
| Southal, . . . . .         | 1,62,560                            | 254           | . . . .                                                                                                                            | . . . .                                         | This cleared land lies in the valleys and lowlands.                                                                     |
| Grand Total, . . . .       | 1,98,400                            | 310           | 1056.01                                                                                                                            | 1366.01                                         | Which allows each inhabitant 6d. 0 r. 34 pls. acres upon the total or gross area; or 1 ac. 2 rd. 3 pls. of cultivation. |

## Statement showing the amount of Assessment and approximate Expenditure on account of Damini-koh, for the year 1851.

| Expenditure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Receipts, 1851.                             | Remarks.                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Co.'s Rs.</p> <p>Expenses for collecting the Revenue, . . . 340</p> <p>Expenses for the Bhaugulpore Hill Rangers; about 400 men at 5 per mensem; besides officers, . . . . . 30,000</p> <p>Superintendent's pay, . . . . . 6,600</p> <p>Ditto travelling allowance, . . . . . 360</p> <p>Ditto Elephants, . . . . . 360</p> <p>Pensions paid to the hill chiefs and others; viz., 17 Sirdars at 10, . . . 15,000</p> <p>70 Naibs at 3, . . . . .</p> <p>435 Mangis at 2, . . . . .</p> <p>Total, . . . . . 555 Pensioners.</p> | <p>Co.'s Rs. As. P.</p> <p>43,918 13 5½</p> | <p>It will be seen from this statement that the Damini-koh territory which supports the large population of 1,17,045 souls, also supports a Regiment of 400 men; and enables Government to grant 15,000 Rs. yearly as pensions to a half wild race who would were not they paid these trifling pensions, be an intolerable nuisance to the neighbouring districts.</p> |
| Grand Total Expenditure, . . . . . 52,660                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 43,918 13 5½                                | Grand total receipts.                                                                                                                                                                                                                                                                                                                                                  |



*To Dr. A SPRENGER, Secretary to the Asiatic Society.*

MY DEAR SPRENGER,—I have the pleasure to forward to you, for publication in the *Journal of the Asiatic Society*, a letter from W. Elliot, Esq. dated the 30th August, together with a comparative list of the Upanishads and extracts from the Mahāvākya Ratnāvali and the Muktika Upanishads, to which I added an English translation.

Mr. Elliot's list of the Upanishads, as received among the Telingana Paṇḍits,—the first complete one that has ever been published—will be of great value to all those who take an interest in those curious monuments of antiquity, and will, no doubt, induce other friends of Sanscrit literature, whose position gives them an opportunity of doing so, to collect similar lists among the Paṇḍits of different parts of India, especially at Benares, in the country of the Mahrattas and in Rajasthana.

Yours sincerely,

*Howrah, 31st Oct. 1851.*

E. ROER.

*To Dr. E. ROER, Calcutta.*

*Masulipatam, August 30th, 1851.*

DEAR SIR,—On receiving the October number for 1850 of the *Bibliotheca Indica* (Vol. VII. No. 34) some weeks ago, I compared the list of Upanishads given in the preface, with those known to the Paṇḍits of this part of India (Telingana), and finding the variations to be considerable, I have thought that it might perhaps be interesting to you to see the result of my examination. I must premise however that I have never given my attention to this branch of Brahminical learning, and I trust therefore you will pardon me, if you find the particulars I now send, either crude or superfluous.

The number of Upanishads contained in your list (pref. v.—vii. note) compiled from those of Colebrooke, Weber, Anquetil du Perron, &c. is 95. The received lists of this part of India exhibit the larger number of 108. But in your list, different parts of the same Upanishad bear separate Nos., as for instance, the Mandukya, which in Colebrooke's list is entered "Nos. 12—15." Adopting these additional numbers wherever they occur in yours, the Telugu list is increased to 120. Of all these I have copies, or am able to procure them, besides which I possess three other works, termed Upanishads

though not found in the received lists. I enclose a memorandum marked A. showing the whole of these. The first column contains the numbers of the Telugu works arranged conformably to your list, founded on Colebrooke's, which (i. e. Colebrooke's) is given in the second column, Anquetil's in the third and the Miscellaneous Nos. from Weber and other sources in the fourth. The order of the numbers, I may remark, is derived only from the preface above referred to (No. 34 of Vol. VII.) and may not therefore be quite correct. The remaining works known to the Telugu Pandits then follow alphabetically, the three extra ones, being marked with a ;\* viz. Nos. 87, 103 and 123, the last having been added subsequent to the preparation of the list. In the first of these three, the Mahāvācyā Ratnāvālī, an enumeration of the whole 108 Nos. occurs with a specification of the Vedas to which they belong. A similar list is likewise found in the Muctica Upanishad, No. 93 in my list. Extracts from these two works transcribed in Nāgari characters and marked B and C are enclosed. I have made enquiry for the Ṭīca of Ānandagiri on the Swetaswātara Upanishad, but hitherto without success.

There is a notice in the last No. of the Journ. As. Soc. (III. of 1851, p. 283) inviting aid in procuring MSS. of the Saṅhita of the Black Yajur Veda and its commentary by Sayanaacharya. Copies of portions of these are not uncommon and no great difficulty would be experienced in collecting a complete set, both of the text and commentary. Most of them are in palm leaves, but some are on paper, all however are in Teulgu characters.

It will give me great pleasure if I can be of any assistance to join in the valuable labours in which you are engaged, by procuring for you any information which this province can furnish, but in doing so, I am sorry to say, I can bring no critical knowledge to bear on the value of such materials as may fall in my way.

I am, dear Sir,

Yours very faithfully,

WALTER ELLIOT.

## A.

| Nos. as per Telugu List. | Nos. in Colebrooke's List. | Nos. in Anquetil Du Perron's List. | Nos. in Dr. Weber's List. | Names of Upanishads.             |
|--------------------------|----------------------------|------------------------------------|---------------------------|----------------------------------|
| 1                        | 1                          | 4                                  | ..                        | Muṇḍakópanishad.                 |
| 2                        | 2                          | 14                                 | ..                        | Prasnópanishad.                  |
| 3                        | 3                          | 25                                 | ..                        | Brahmavidyópanishad.             |
| 4                        | 4                          | 33                                 | ..                        | Kshurikópanishad.                |
| ..                       | 5                          | 41                                 | ..                        | Chúlíka.                         |
| 5                        | 6                          | 9                                  | ..                        | Atharva sirópanishad.            |
| 6                        | 7                          | 23                                 | ..                        | Atharva sikhópanishad.           |
| 7                        | 8                          | 28                                 | ..                        | Garbhópanishad.                  |
| 8                        | 9                          | 16                                 | ..                        | Mahópanishad.                    |
| 9                        | 10                         | ..                                 | ..                        | Brahma.                          |
| 10                       | 11                         | 48                                 | ..                        | Pránágni hótrópanishad.          |
| 11—14                    | 12—15                      | 31                                 | ..                        | Mándúkyópanishad.                |
| ..                       | 16                         | ..                                 | ..                        | Nílarudra.                       |
| 15                       | 17                         | ..                                 | ..                        | Nádabindúpanishad.               |
| ..                       | 18                         | ..                                 | ..                        | Brahmabindu.                     |
| 16                       | 19                         | 26                                 | ..                        | Amritabindúpanishad.             |
| 17                       | 20                         | 15                                 | ..                        | Dhyánabindúpanishad.             |
| 18                       | 21                         | 27                                 | ..                        | Téjóbindúpanishad.               |
| 19                       | 22                         | 20                                 | ..                        | Yógasikshópanishad.              |
| 20                       | 23                         | 21                                 | ..                        | Yógatátwópanishad.               |
| 21                       | 24                         | ..                                 | ..                        | Sanyásópanishad.                 |
| 22                       | 25                         | 35                                 | ..                        | Árunikópanishad.                 |
| ..                       | 26                         | ..                                 | ..                        | Kanṭhas'ruti.                    |
| ..                       | 27                         | ..                                 | ..                        | Piṇḍu.                           |
| 23                       | 28                         | 24                                 | ..                        | Átmavidyópanishad.               |
| 24—29                    | 29—34                      | 50                                 | ..                        | Nrisinha tápaniyya.              |
| 30—31                    | 35—36                      | 37                                 | ..                        | Kaṭhavalli upanishad.            |
| 32                       | 37                         | 46                                 | ..                        | Kénópanishad.                    |
| 33                       | 38                         | 7                                  | ..                        | Náráyaṇópanishad.                |
| 34—35                    | 39—40                      | 30                                 | ..                        | Vrihannáráyaṇa.                  |
| 36                       | 41                         | 6                                  | ..                        | Sarwasárópanishad.               |
| 37                       | 42                         | ..                                 | ..                        | Hansópanishad.                   |
| 38                       | 43                         | 34                                 | ..                        | Paramahansa parivrájakópanishad. |
| ..                       | 44                         | 38                                 | ..                        | Ánandavalli.                     |
| ..                       | 45                         | 39                                 | ..                        | Bhriguvalli.                     |
| 39                       | 46                         | ..                                 | ..                        | Gáruḍópanishad.                  |
| 40                       | 47                         | ..                                 | ..                        | Kálágnirudrópanishad.            |
| 41—42                    | 48—49                      | ..                                 | ..                        | Rámatápaniyya.                   |
| 43                       | 50                         | 18                                 | ..                        | Kaivalyópanishad.                |

| Nos. as per Telugu List. | Nos. in Colebrooke's List. | Nos. in Anquetil Du Perron's List. | Nos. in Dr. Weber's List. | Names of Upanishads.         |
|--------------------------|----------------------------|------------------------------------|---------------------------|------------------------------|
| 44                       | 51                         | 29                                 | ..                        | Jábálopanishad.              |
| ..                       | 52                         | ..                                 | ..                        | Ásrama.                      |
| 45                       | 53                         | 1                                  | ..                        | Ch'hándógyópanishad.         |
| 46                       | 54                         | 2                                  | ..                        | Vrihadárayaka.               |
| 47                       | 55                         | 3                                  | ..                        | Maitráyaṇi upanishad.        |
| 48                       | 56                         | 4                                  | ..                        | Isávásyópanishad.            |
| 49                       | 57                         | 11                                 | ..                        | Aitaréyópanishad.            |
| 50                       | 58                         | 12                                 | ..                        | Koushítakópanishad.          |
| 51                       | 59                         | 13                                 | ..                        | Swétáswatarópanishad.        |
| 52—53                    | 60—61                      | ..                                 | 76—77                     | Gópálatápaniyyópanishad.     |
| ..                       | 62—66                      | ..                                 | 78—82                     | Sundara tápini.              |
| 54                       | 67                         | ..                                 | 83                        | Tripurá tapanópauishad.      |
| 55                       | 68                         | ..                                 | 84                        | Tripurópanishad.             |
| 56                       | 69                         | ..                                 | 85                        | Scandópanishad.              |
| ..                       | 70                         | ..                                 | 86                        | Koula.                       |
| ..                       | 71                         | ..                                 | 87                        | Gópíchandanam.               |
| 57                       | 72                         | ..                                 | 88                        | Darsanópanishad.             |
| 58                       | 73                         | ..                                 | 89                        | Vajrasúchikópanishad.        |
| ..                       | ..                         | 10                                 | ..                        | Hansanáda.                   |
| 59                       | ..                         | 17                                 | ..                        | Átmabódhópanishad.           |
| ..                       | ..                         | 32                                 | ..                        | Shekl or Pankl.              |
| ..                       | ..                         | 42                                 | ..                        | Amrat Lankoul.               |
| 60                       | ..                         | 43                                 | ..                        | Amrita nádópanishad.         |
| ..                       | ..                         | 46                                 | ..                        | Táraka.                      |
| ..                       | ..                         | 47                                 | ..                        | Arkhi.                       |
| ..                       | ..                         | 49                                 | ..                        | Savank.                      |
| ..                       | ..                         | 8                                  | ..                        | Tadéva.                      |
| ..                       | ..                         | 19                                 | ..                        | Sata rudriya.                |
| ..                       | ..                         | 22                                 | ..                        | Siva sankalpa.               |
| ..                       | ..                         | 40                                 | ..                        | Purusha súkta.               |
| ..                       | ..                         | 44                                 | ..                        | Váshkala.                    |
| ..                       | ..                         | 45                                 | ..                        | Tschakli.                    |
| ..                       | ..                         | ..                                 | ..                        | Rudra,                       |
| ..                       | ..                         | ..                                 | ..                        | Atharvaniya rudra,           |
| 61                       | ..                         | ..                                 | ..                        | Paingala,                    |
| 62                       | ..                         | ..                                 | 94                        | Nirálambópanishad.           |
| ..                       | ..                         | ..                                 | 95                        | Srimadatta (St. Petersburg.) |
| 63                       | ..                         | ..                                 | 90                        | Taittiriyyópanishad.         |
| 64                       | ..                         | ..                                 | ..                        | Adhyátmópanishad.            |
| 65                       | ..                         | ..                                 | ..                        | Adwaitárkópanishad.          |

} E. I. II.  
No. 1,686.

| Nos. as per Telugu List. | Nos. in Colebrooke's List. | Nos. in Anquetil Du Perron's List. | Nos. in Dr. Weber's List. | Names of Upanishads.        |
|--------------------------|----------------------------|------------------------------------|---------------------------|-----------------------------|
| 66                       | ::                         | ::                                 | ::                        | Akshamálikópanishad.        |
| 67                       | ::                         | ::                                 | ::                        | Akshyúpanishad.             |
| 68                       | ::                         | ::                                 | ::                        | Annapúrúpanishad.           |
| 69                       | ::                         | ::                                 | ::                        | Avadhútópanishad.           |
| 70                       | ::                         | ::                                 | ::                        | Avyaktópanishad.            |
| 71                       | ::                         | ::                                 | ::                        | Bahwrichópanishad.          |
| 72                       | ::                         | ::                                 | ::                        | Bhasma Jábálopánishad.      |
| 73                       | ::                         | ::                                 | ::                        | Bhávánópanishad.            |
| 74                       | ::                         | ::                                 | ::                        | Bhikshukópanishad.          |
| 75                       | ::                         | ::                                 | ::                        | Brihájábálopánishad.        |
| 76                       | ::                         | ::                                 | ::                        | Dakshañá múrtil upanishad.  |
| 77                       | ::                         | ::                                 | ::                        | Dattátréyópanishad.         |
| 78                       | ::                         | ::                                 | ::                        | Dévyupanishad.              |
| 79                       | ::                         | ::                                 | ::                        | Ekáksharópanishad.          |
| 80                       | ::                         | ::                                 | ::                        | Ganapatyupanishad.          |
| 81                       | ::                         | ::                                 | ::                        | Hayagrivópanishad.          |
| 82                       | ::                         | ::                                 | ::                        | Jábályupanishad.            |
| 83                       | ::                         | ::                                 | ::                        | Kalisantarañópanishad.      |
| 84                       | ::                         | ::                                 | ::                        | Kaṭhópanishad.              |
| 85                       | ::                         | ::                                 | ::                        | Krishñópanishad.            |
| 86                       | ::                         | ::                                 | ::                        | Kuñḍinakópanishad.          |
| 87                       | ::                         | ::                                 | ::                        | Mahárákya ratnávali.        |
| 88                       | ::                         | ::                                 | ::                        | Mahárákyópanishad.          |
| 89                       | ::                         | ::                                 | ::                        | Maitréyyupanishad.          |
| 90                       | ::                         | ::                                 | ::                        | Mañḍala brahmópanishad.     |
| 91                       | ::                         | ::                                 | ::                        | Mantrikópanishad.           |
| 92                       | ::                         | ::                                 | ::                        | Mudgalópanishad.            |
| 93                       | ::                         | ::                                 | ::                        | Muktikópanishad.            |
| 94                       | ::                         | ::                                 | ::                        | Nárada parivrájakópanishad. |
| 95                       | ::                         | ::                                 | ::                        | Nirwánópanishad.            |
| 96                       | ::                         | ::                                 | ::                        | Parabrahmópanishad.         |
| 97                       | ::                         | ::                                 | ::                        | Panchabrahmópanishad.       |
| 98                       | ::                         | ::                                 | ::                        | Parama hausópanishad.       |
| 99                       | ::                         | ::                                 | ::                        | Pásupada brahmópanishad.    |
| 100                      | ::                         | ::                                 | ::                        | Rahasyópanishad.            |
| 101                      | ::                         | ::                                 | ::                        | Ráma rahasyópanishad.       |
| 102                      | ::                         | ::                                 | ::                        | Rudrahridayópanishad.       |
| 103                      | ::                         | ::                                 | ::                        | Rudra Jábálopánishad.       |
| 104                      | ::                         | ::                                 | ::                        | Rudrákshópanishad.          |

| Nos. as per<br>Telugu<br>List. | Nos. in Cole-<br>brooke's List. | Nos. in Anque-<br>til Du Perron's<br>List. | Nos. in Dr.<br>Weber's List. | Names of Upanishads.          |
|--------------------------------|---------------------------------|--------------------------------------------|------------------------------|-------------------------------|
| 105                            | ..                              | ..                                         | ..                           | Sāṅḍilyópanishad.             |
| 106                            | ..                              | ..                                         | ..                           | Sarabhópanishad.              |
| 107                            | ..                              | ..                                         | ..                           | Saraswati rahasyópanishad.    |
| 108                            | ..                              | ..                                         | ..                           | Sárirakópanishad.             |
| 109                            | ..                              | ..                                         | ..                           | Sátyániyyópanishad.           |
| 110                            | ..                              | ..                                         | ..                           | Sávitryúpanishad.             |
| 111                            | ..                              | ..                                         | ..                           | Sítópanishad.                 |
| 112                            | ..                              | ..                                         | ..                           | Soubhágya laksmyupanishad.    |
| 113                            | ..                              | ..                                         | ..                           | Subálópanishad.               |
| 114                            | ..                              | ..                                         | ..                           | Súryópanishad.                |
| 115                            | ..                              | ..                                         | ..                           | Tárasáropanishad.             |
| 116                            | ..                              | ..                                         | ..                           | Trisikhi brahmanópanishad.    |
| 117                            | ..                              | ..                                         | ..                           | Turiyyátita Avadhútópanishad. |
| 118                            | ..                              | ..                                         | ..                           | Varáhópanishad.               |
| 119                            | ..                              | ..                                         | ..                           | Vásudéropanishad.             |
| 120                            | ..                              | ..                                         | ..                           | Yágnavalkyópanishad.          |
| 121                            | ..                              | ..                                         | ..                           | Yógachúdámāṇi upanishad.      |
| 122                            | ..                              | ..                                         | ..                           | Yóga kuṇḍaly upanishad.       |
| 123                            | ..                              | ..                                         | ..                           | Gáyatri upanishad.            |

B. *Extract from the Mahávákya Ratnávali.*

ऋग्वेदादिविभागेन वेदाश्चत्वारः । तत्रैकविंशति शाखा ऋचः ।  
नवाधिकशतशाखा यजुषः । सहस्रशाखास्मान्नः । पञ्चाशच्छाखा अथर्व-  
णस्य । एकैकस्याः शाखाया एकैकोपनिषत् । आहृत्याशीत्यधिकशतसह-  
स्रसंख्याका उपनिषदः । ताम् श्रीरामचंद्रेण रामदूताय सारतरोपनि-  
षद अष्टोत्तरशतसंख्याका उपदिष्टाः । तथाच मुक्तिकोपनिषत्साष्टोत्त-  
रशतनामश्लोका लिख्यन्ते ।

तत्र दशोपनिषद ऋग्वेदगताः । शुक्लछण्णभेदेन यजुःश्वेकपञ्चाशत् ।  
तत्र शुक्लयजुःश्वेकोनविंशतिः । छण्णयजुषो द्वात्रिंशत् । सामः षोडश ।  
अथर्वणस्यैकत्रिंशत् । आहृत्याष्टोत्तरशतं ।

1. There are four Védas according to the division of them into Rig, Yajur, etc. Vedas. There are 21 schools of the Rig, 109 of the

Yajur, 1000 of the Sâma and 50 of the Atharvaṇa. To every school belongs one Upanishad. There are in total 1180 Upanishads. The venerable Râmachandra instructed his messenger (Hanumân) that among them, 108 are principal Upanishads; accordingly in the Muktikâ Upanishad several Slokas are written, containing the names of 108 Upanishads.

With reference to this the Rig Vêda contains 10 Upanishads, the Yajur in its two divisions, viz. the white and the black Yajur, 51, viz. the white 19 and the black 32, the Sâma 16, and the Atharvaṇa 31; in total 108.

C. *Extract from the Muktikâ Upanishad.*

राम वेदाः कतिविधाः तेषां शाखाश्च राघव ।  
 तासूपनिषदः काः स्युः ह्यपया वद तत्वतः ॥  
 ऋग्वेदादिविभागेन वेदाश्चत्वार ईरिताः ।  
 तेषां शाखा ह्यनेकाः स्युः तासूपनिषदस्तथा ॥  
 ऋग्वेदस्य तु शाखाः स्युः एकविंशति सङ्ख्या ।  
 नवाधिकं शतं शाखा यजुषो मारुतात्मज ॥  
 सहस्रसङ्ख्या जाताः शाखास्मान्नः परन्तप ।  
 अथर्वणस्य शाखाः स्युः पञ्चाशद्भेदतो हरे ॥  
 एकैकस्यास्तु शाखाया एकैकोपनिषन्मता ।  
 विदेहमुक्ताविच्छा चेदद्योत्तरशतं पठ ॥  
 तासां क्रमं सशान्तिं च शृणु वक्ष्यामि तत्वतः ।  
 ईशा केन कठ प्रश्न मुखे मांडूक्य तित्तिरिः ॥  
 ऐतरेयं च कान्द्योग्यं बृहदारण्यकं तथा ।  
 ब्रह्म कैवल्य जाबाल श्वेताश्वो हंस आरुणिः ॥  
 गर्भो नारायणो हंसो बिन्दु नाद शिरः शिखा ।  
 मैत्रायणी कौषीतकी बृहज्जाबाल तापिनी ॥  
 कालाग्निरुद्र मैत्रेयी सुवाल क्षुरि मन्त्रिका ।  
 सर्वसारं निरालम्बं रहस्यं वचसूचिकं ॥  
 तेजो नाद ध्यान विद्या योगतत्वात्मबोधकं ।  
 परिव्राट् त्रिषिखी सीता चूडा निर्वाण मण्डलं ॥  
 दक्षिणा शरभं स्कन्दं महानारायणाऽद्वयं ।  
 रहस्यं रामतपनं वासुदेवं च मुद्गलं ॥

शाखिलं पैगलं भिक्षु महच्छारीरकं शिखा ।  
 तुरीयातीत सन्यास परिव्राजाऽक्षमालिका ॥  
 अथक्त एकाक्षरं पूर्णं सूर्याक्ष्यऽध्यात्म कुण्डिका ।  
 सावित्र्य आत्मा पाशुपतं परब्रह्मा वधूतकं ॥  
 त्रिपुरातपनं देवी त्रिपुरा कठ भावना ।  
 हृदयं कुण्डली भस्म रुद्राक्ष गण दर्शनं ॥  
 तारसार महावाक्य पञ्चब्रह्माग्निहोत्रकं ।  
 गोपालतपनं कृष्णं याज्ञवल्क्यं वराहकं ॥  
 शाक्यायनी हृयग्रीवं दत्तात्रेयं च गारुडं ।  
 कलि जाबाल सौभाग्य रहस्य ऋच मुक्तिका ॥  
 एवमष्टोत्तरशतं भावनात्रयनाशनं ।

अथ हैनं श्रीरामचन्द्रं मारुतिः पप्रच्छ ऋग्वेदादिविभागेनैव पृथक्  
 शान्तिमनुब्रूहीति । स होवाच श्रीरामः । ऐतरेय कौषतकि नादविन्दु  
 आत्मबोध निर्वाण मुद्गल अक्षमालिका त्रिपुरा सौभाग्य बह्वचानाम्-  
 ग्वेदगतानां दशसंख्याकानामुपनिषदां वाङ्मे मनसीति शान्तिः ।

ईशावास्य बृहदारण्यक जाबाल हंस परमहंस सुबाल मन्त्रिका  
 निरालम्ब त्रिशिखीब्राह्मण मण्डलब्राह्मण अद्वय तारक पैगल भिक्षु  
 तुरीयातीत अध्यात्म तारसार याज्ञवल्क्य शाक्यायनी मुक्तिकानां  
 शुक्लयजुर्वेदगतानामेकोनविंशतिसङ्ख्याकानामुपनिषदां पूर्णमद इति  
 शान्तिः ।

कठवल्ली तैत्तरीयक ब्रह्म कैवल्य श्वेताश्वतर गर्भ नारायण अमृत-  
 विन्दु अमृतनाद कालाग्निरुद्र क्षुरिका सर्वसार शुकरहस्य तेजोविन्दु  
 ध्यानविन्दु ब्रह्मविद्या योगतत्त्व दक्षिणामूर्ति स्कन्द शारीरक योग-  
 शिखो एकाक्षर अक्षि अवधूत कठरुद्र हृदययोग कुण्डलिनी पञ्च-  
 ब्रह्म प्राणाग्निहोत्र वराह कलिसंतरण सरस्वतीरहस्यानां कृष्णयजुर्वेद-  
 गतानां द्वात्रिंशत्सङ्ख्याकानामुपनिषदां सह नाववत्विति शान्तिः ।

केन क्वादोग्य आरुणि मैत्रायणि मैत्रेयी वषट्चक योगचूडामणि  
 वासुदेव मह सन्यास अथक्त कुण्डिका सावित्री रुद्राक्ष दर्शन जाबा-  
 लीनां सामवेदगतानां षोडशसंख्याकानामुपनिषदामाप्यायंत्विति  
 शान्तिः ।



प्रश्न मुण्ड माण्डूक्याऽऽथर्वशिरोऽथर्वशिखे बृहज्जाबाल नृसिंहतापनी  
नारदपरित्राजक सीता शरभ महानारायण रामरहस्य रामतापनी  
शाण्डिल्य परमहंसपरित्राजक अन्नपूर्सु सूर्यात्म पाशुपत परब्रह्म  
त्रिपुरातपन देवी भावना भस्म जाबाल गणपति महावाक्य गोपाल-  
तपन कृष्ण ह्यग्रीव दत्तात्रेय गारुडानामथर्ववेदगतानामेकत्रिंशत् सं-  
ख्याकानामुपनिषदां भद्रं कर्णेभिरिति शान्तिः ।

1. O descendant of Raghu, Rāma, how many Védas are there, and among them how many schools (Sákhas), and which are the Upanishads of the latter? In pity tell me this according to the truth.

2. (Rāma answers :) Four Védas are known according to the division of them into Rig, Yajur, etc. Vēda. The schools of them are numerous, and in the same manner their Upanishads.

3. The number of schools of the Rig Vēda is 21, of the Yajur 109, O son of Mārut (of the wind, Hanumán).

4. 1000 in number are the schools of the Sāma, O fear of enemies ; and of the Atharvāṇa 50, according to division.

5. It is agreed, that to each Sákha belongs one Upanishad. If it is a desire for liberation without body (what constitutes an Upanishad) then say, there are 108.

6. Listen to their order and their formula of benediction. I will speak in truth. 1, The Īsa. 2, Kēna. 3, Kaṭha. 4, Prasua. 5, Muṇḍa. 6, Māṇḍūkya. 7, Tittiri.

7. 8, Aitarēya. 9, Chandogya. 10, Brihadāranyaka. 11, Bramha. 12, Kaivalya. 13, Jábála. 14, Swétáswatara. 15, Hansa. 16, Āruṇi.

8. 17, Garbha. 18, Nárāyaṇa. 19, Hansa (Parama H.) 20, Vindu (Amrita V.) 21, Náda, (Amrita N.) 22, Siras (Atharva S.) 23, Sikhá. 24, Maitráyaṇí. 25, Kaushatakí. 26, Brihadjábála. 27, Tápíní.

9. 28, Kálāgni Rudra. 29, Maitréya. 30, Subála. 31, Kshurika. 32, Mantrika. 33, Sarvasára. 34, Nirálamba. 35, Rahasya (S'uka R.) 36, Vajrasúchika.

10. 37, Téjas (Téjovindu). 38, Náda (Nadavindu). 39, Dhyána (Dhyánavindu.) 40, Brahma (Brahmavidyá). 41, Yogatattwa. 42, Átmabodha. 43, Parivrát (Paramahansa parivrát.) 44, Trisikhí (Trisikhí Brámhāna). 45, Sítá. 46, (Chúdá) (Chulika.) 47, Nirvána. 48, Maṇḍala (M. Bramhāna.)

11. 49, Dakshiṇá (D. Múrti.) 50, Sarabha. 51, Skanda. 52, Mahánárayāna. 53, Adwaya. 54, Rahasya (Saraswati R.) 55, Ramatapana. 56, Vasudéva. 57, Mudgala.

12. 58, Sándila. 59, Paingala. 60, Bhikshu. 61, Mahá. 62, Sáriraka. 63, S'ikhá (Yoga S'.) 64, Turíyátíta. 65, Sanyása. 66, Parivrāja (Narada P.) 67, Akshamáliká.

13. 68, Avyakta. 69, Ekákshara. 70, Púrṇa (Anna P.) 71, Surya. 72, Akshi. 73, Adhyátma. 74, Kuṇḍiká. 75, Sávitri. 76, Átma. 77, Pás'upata. 78, Parabramha. 79, Avadhúta.

14. 80, Tripurátapana. 81, Déví. 82, Tripurá. 83, Kaṭha (Rudra K.) 84, Bhávaná. 85, Hridaya (Rudra H.) 86, Kuṇḍalí. 87, Bhasma (B. Jábála.) 88, Rudráksha. 89, Gaṇa (G. Pati.) 90, Dars'āna.

15. 91, Tárasára. 92, Mahávákya. 93, Panchabramha. 94, Agni-hotraka (Práṇa A.) 95, Gopálatapana. 96, Krishya (K. Tapana). 97, Yájnavalkya. 98, Varáha.

16. 99, Sátyáyáni. 100, Hayagríva. 101, Dattátréya. 102, Gáruḍa. 103, Kali (K. Santarāna). 104, Jábála. 105, Saubhagya. 106, Rahasya (Ra'ma R.) 107, Rieha (Bahwricha). 108, Muktiká.

17. Then the son of the wind asked the illustrious Rámachandra : Pray, tell the different formulas of benediction for the Rig and the other Védas. The illustrious Rámachandra said : The formula of benediction for the 10 Upanishads of the Rig Véda, viz. 1, of the Aitaréya. 2, Kaushataki. 3, Náda-Bindu. 4, Átmabodha. 5, Nirvána. 6, Mudgala. 7, Akshamáliká. 8, Tripurá. 9, Saubhágya and 10, Bahwricha is, as follows : My word is placed in my mind, *and* my mind is placed in my word, etc.

18. The formula of benediction for the 19 Upanishads of the white Yajurvéda, viz. 1, of the Isávasya. 2, Brihadáranyaka. 3, Jábála. 4, Hansa. 5, Paramahansa. 6, Subála. 7, Mantriká. 8, Nirá-

lamba. 9, Trisikhí-Brámhaṇa. 10, Maṇḍala Brámhaṇa. 11, Adwya Táraka. 12, Paingala. 13, Bhikshu. 14, Turiyátíta. 15, Adhy-átma. 16, Tárasára. 17, Yájnavalkya. 18, Sátyayaní and Muktiká Upanishads, is as follows: This is filled, and that is filled; the full is greater than the full, etc.

19. The formula of benediction for the 32 Upanishads of the black Yajur Véda, viz. 1, of the Kaṭhavallí. 2, Taittiriya. 3, Bramha. 4, Kaivalya. 5, Swétáswatara. 6, Garbha. 7, Náráyana. 8, Amrita Bindu. 9, Amrita Náda. 10, Kálágni Rudra. 11, Kshurika. 12, Sarvasára. 13, Sukarahasya. 14, Téjobindu. 15, Dhyánabindu. 16, Bramhavidyá. 17, Yogatattwa. 18, Dakshinámúrtil. 19, Skanda. 20, Sáríraka. 21, Yogasikhá. 22, Ekákshara. 23, Akshi. 24, Avadhúta. 25, Kaṭha. 26, Rudrahridaya. 27, Yoga Kuṇḍaliní. 28, Panchabrahma. 29, Pránágnihotra. 30, Varáha. 31, Kalisantarana. 32, Saraswatí rahasya, is as follows: Do thou protect us, do thou preserve us, etc.

20. The formula of benediction for the 16 Upanishads of the Sáma, viz. 1, of the Kéna. 2, Chandogya. 3, Aruṇi. 4, Maitráyani. 5, Maitréyí. 6, Vajra-súchaka. 7, Yogachúdámaṇi. 8, Vasudéva. 9, Mahá. 10, Sanyása. 11, Avyakta. 12, Kuṇḍiká. 13, Sa'vitri. 14, Rudráksha. 15, Dars'ana; and 16, Jábálí, is as follows: Let all my members, my speech, etc.

21. The formula of benediction of the 31 Upanishads of the Atharva, viz. 1, of the Prasna. 2, Muṇḍa. 3, Máṇḍúkyá. 4, Atharvasiras. 5, Atharvasikha. 6, Brihad Jábála. 7, Nrisinha Tápaní. 8, Nárada Parivrájaka. 9, Sítá. 10, S'arabha. 11, Maháuáráyana. 12, Rámarahasya. 13, Rámatápaní. 14, Sāṇḍilya. 15, Paramahansa Parivrájaka. 16, Annapúrṇa. 17, Súrya. 18, Átma. 19, Pá. s'upata. 20, Parabramha. 21. Tripurá Tapana. 22, Déví. 23, Bhávaná. 24, Bhasmajábála. 25, Gaṇapati. 26, Mahávákya. 27. Gopála Tapana. 28, Krishṇa. 29, Hayagriva. 30, Dattátréya. 31, Gáruḍa,—Upanishads, is as follows: O deities, let us hear auspicious words with our ears, etc.

*Some Remarks on the foregoing lists of Upanishads, by E. ROER.*

In comparing the list of Mr. Elliot (which is the same with that of the Mahāvākya Ratnávali and the Muktika Upanishads) with the collection of Upanishads in the Atharva Véda, we find considerable differences between them.

1. Only 10 Upanishads in both list are equally assigned to the Atharva-Véda, viz.

1, Muṇḍa. 2, Pras'na. 3, Atharvasíras. 4, Atharvas'ikhá. 5, Mán-dúkyá. 6, Átma. 7, Nrisinha Tápana. 8, Brihadnáráyana (Mahá N.) 9, Gáruḍa and 10 Rámatápaní.

2. Twenty-two Upanishads in the Atharva collection are assigned to other Védas in Mr. Elliot's list, viz.

To the Rig Véda (1.) 1, Náda Bindu.

To the White Yájur (3.) viz. 2, S'ikhá. 3, Jábála; and 4, Hansa.

To the Black Yajur (14.) viz. 5, Bramha. 6, Pra'na'gnihotra. 7, Amrita-Bindu. 8, Dhyána-Bindu. 9, Tejo-Bindu. 10, Kaṭha-Valli. 11, Náráyana. 12, Kaivalya. 13, Kshurika. 14, Garbha. 15, Yoga S'ikhá. 16, Yoga Tattwa. 17, Kálágni Rudra. 18, Sarvasára.

To the Sáma (4.) viz. 19, Mahá. 20, Sanyása. 21, Árunya; and 22, Kéna.

3. Eight Upanishads belong exclusively to the Atharva collection, viz. 1, Chúlíka. 2, Níla-Rudra. 3, Brahma Bindu. 4, Kaṭha S'ruti. 5, Pinḍu. 6, Ánanda-valli. 7, Brigu-valli; and 8, Ásrama.

4. Twenty-one Upanishads, which according to the Muktika belong to the Atharva Véda, are not found in the Atharva collection. They are :

1, Brihad-Jábála. 2, Nárada-Parivrájaka. 3, Sitá. 4, Sarabha. 5, Ráma-Rahasya. 6, Saṇḍila. 7, Paramahansa-Parivrájaka. 8, Annapurṇa. 9, Surya. 10, Pasúpati. 11, Parabramha. 12, Tripura-Tapana. 13, Déví. 14, Bhávaná. 15, Bhasma-Jábála. 16, Gaṇapati. 17, Mahāvākya. 18, Gopala-Tapana. 19, Krishṇa. 20, Haya-Gríva; and 21, Dattatréya.

5. Anquetil du Perron's list also deviates from both Mr. Elliot's and the Atharva Véda list. It resembles, however, more closely the latter, as 27 Upanishads are the same in both lists, while it has only

8 of the Atharva Vēda Upanishads in common with Mr. Elliot's list (viz. 1, Muṇḍa. 2, Pras'na. 3, Atharvas'iras. 4, Atharvas'ikhá, 5, Māṇḍúkyá. 6, Átma. 7, Nrisinha-Tapaniya. 8, Brihad-Náráyana.)

6. Thirteen Upanishads are counted in Anquetil's collection to the Atharva, which are assigned in Mr. Elliot's list to other Vēdas. (viz. 1, Kshuriká. 2, Garbha. 3, Maha. 4, Práya, (Pránágnihotra.) 5, Amrita-Bindu. 6, Tejo-Bindu. 7, Dhyána-Bindu. 8, Yogasikhá. 9, Yogatattwa. 10, Aruṇiya. 11, Kaṭhaka. 12, Kéna. 13, Náráyana. 14, Paramahansa. 15, Kaivalya. 16, Jábála. 17, Amrita-Náda.

7. The following are exclusively found in Anquetil's list.

1, Hansanáda. 2, Atmabodha. 3, Shekl or Pankl, (Sákalya W.) 4, Amrita-Lankoul, (Amrita-Alaukara W.) 5, Táraka (perhaps Tárasára.) 7, Arkhi (Akshi?) 8, Saunaka (Savank.) 9, Padeva. 10, Sattarudriya. 11, Sivasankalpa. 12, Purushasúkta. 13, Váshkala. 14, Tshakli.

8. From the above comparison it is evident, that the three lists have been taken from different authorities, and it is probable, that yet more will be found, of different numbers and arrangement. Which of the treatises, called Upanishads, are taken from the Vēdas themselves, and which are added to them at a later period, cannot be decided, before all the Vēdas are published, when it will be possible, gradually to ascertain the time of their composition.

9. The whole number of Upanishads according to the three lists and other authorities is :

and added the parts which in other arrangements are considered as different Upanishads.

|                                      |     |           |     |
|--------------------------------------|-----|-----------|-----|
| Of the Telingana list, . . . . .     | 108 | . . . . . | 120 |
| Added by Mr. Elliot, . . . . .       | 3   | . . . . . | 3   |
| Of the Atharva Collection, . . . . . | 7   | . . . . . | 7   |
| Of Anquetil's list, . . . . .        | 14  | . . . . . | 14  |
| Of other sources, . . . . .          | 6   | . . . . . | 10  |

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## Literary Intelligence.

مختصر نافع *Mokhtaçir Náfi'*. This is an Arabic Law book, and holds with the Shiah's nearly the same place as Qodúry with the Sunnies. It begins like all Law books with purifications. The author's name occurs neither in the title page nor in the preface. The Editor probably did not know it. It is Najm aldyn Abú-l-Qásim Ja'far b. al-Hasan b. Yahyá b. Sa'yid Hilly, He died in A. H. 676, and is also the author of the Shcráyi' alislám which have been printed in Calcutta. A lithographed edition of the *Mokhtaçir Náfi'* has lately (A. H. 1267) been made at Delhi, it is in small 8vo. and has 248 pp. but very little can be said to its praise.

Besides the above, two Persian medical works have been lately (A. H. 1265) lithographed at Delhi. Both are in one volume, large 8vo. 287. pp. One is the *Alfáz aladwiyyah* of which Mr. Gladwin has published an English translation, Calcutta, 1793, 4to. The other is called تالیف شریف *Tályfi Sharyf* from its author *Mohammad Sharyf Khán*, a son of *Mohammad Akmal Khán*. The book is of great importance, inasmuch as it contains the *Materia Medica* of the Hindus. We have a free translation of it by Dr. Playfair. I may mention three other medical works which have been lithographed at Delhi.

علاج الامراض or Practice of Medicine in Persian. The date is a chronogram for A. H. 1257, when the book was composed. This is by the same *Mohammad Sharyf Khán* who compiled the preceding work. It was published in 1264, large 8vo. 611 pp.

طب اکبر A work on the Practice of Medicine in Persian by *Mohammad Akbar*, commonly called *Mohammad Arzány*, who some years ago was a celebrated Physician of Delhi. The practice laid down in this book is now generally in vogue among the Musulmans in India. Large 8vo. 644 pp.

تحفة المومنين Simple and compound Medicines explained in Persian by *Mohammad Mumin Hosayny* of Delhi. Large 8vo. A. H. 1266, 668 pp.

A. Sewell, Esq. Interpreter and Quarter-Master of the 47th Regt. N. I. has favoured the Secretary with the following account of new publications which have issued from the two Lithographic presses which formerly had been established at Lucknow, and were lately obliged to take refuge at Cawupore.

From the Press of *Hájzy Mohammad Hosayn* :

کلید دانش تصنیف کرده عبد الفتاح بعلم فارسی \* رساله قیافه مصنف  
نامعلوم . وظفر جلیل ترجمه کرده نواب قطب الدین خان

Press of *Mostafā Kháu* :

مشارق الانوار در علم حدیث \* و مصدر فیوض در قوانین فارسی \*  
و پنجم سوره مترجم \* و استفتاهای شاه عبد العزیز

At Bombay the *Akhlāq'e Nācıry* has been lithographed, but the hand is so crammed that it requires particularly good eyes to read it.

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#### QUERIES.

The Editor will feel obliged for any information on the undermentioned Queries.

A dispute has been raised in Germany on the meaning of the words *مات عبدالله فی حدود سنه* as for instance in the sentence *مات عبدالله فی حدود سنه* *ستین* The expression is used frequently in biographical works, and it is therefore of great importance to know whether it means "about the year . . . ." or "within the year . . . ." or "towards the end of the year . . . ."

Baron von Hammer Purgstall is very anxious to obtain a copy of the *Díwân* of *Abu-l-Maâni*, or at least some information regarding the poet.

Mr. N. Bland is preparing a Biographical Dictionary of Persian poets. Every one who takes an interest in Persian literature must have felt the want of such a work, and will no doubt be happy to contribute towards it. It is very likely that *Tazkirahs* not accessible to Mr. B. may be found in India, and I therefore give him a list of the *Tazkirahs* known, and should feel obliged if any one who finds one not mentioned in this list would inform me (A. Sprenger, in Calcutta) or Mr. Bland, (Royal Asiatic Society, London.)

|                              |                                  |
|------------------------------|----------------------------------|
| ١٤ انيس الاحبا               | * ١ لباب الالباب تصنيف محمد عوفي |
| * ١٥ يد بيضا                 | ٢. تذكرة الشعراء دولتشاه         |
| ١٦ آتشکده                    | ٣. اسمان سخن                     |
| * ١٧ مجمع النفائس            | * ٤ تذكرة علي شير                |
| ١٨ : ياغى الشعرا تصنيف والده | * ٥ خلاصة الأشعار وزبدة الأفكار  |
| * ١٩ مجمع الغرائب            | ٦ تحفة سامي                      |
| ٢٠ سفينة خوشگو               | * ٧ تذكرة نفائس المائر           |
| ٢١ خزانه عامره               | ٨ تذكرة طاهر ناصرآبادي           |
| ٢٢ تذكرة حسيني               | ٩ كلمات الشعرا تصنيف سرخوش       |
| * ٢٣ جواهر العجائب           | ١٠ هميشه بهار                    |
| ٢٤ مخزن الدكات               | ١١ تذكرة المعاصرين شيخ حزين      |
| ٢٥ سرو آزاد                  | ١٢ مرآة الخيال                   |
| ٢٦ صبح وطن اعظم              | ١٣ مقالات الشعرا                 |

Should copies be obtainable of the Tazkirahs marked with an asterisk I should be glad to purchase them.

Dr. Buist is preparing a work on the Meteorology of India, and would thankfully receive and acknowledge observations from various parts of the country, which may throw light on the subject; such as quantity of rain, and moisture of atmosphere, temperature and its variations, winds, terrestrial magnetism, general features of vegetation, great floods like the one which occurred in the Indus in July, 1841. &c.



PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.

FOR SEPTEMEER, 1851.

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At a Meeting of the Society held on the 3rd instant, at half past 8 P. M.

J. R. COLVIN, Esq. Senior Member of the Council present, in the Chair.

The proceedings of the last Meeting were read and confirmed.

Letters were read :

1st. From Dr. A. Campbell, Darjeling, presenting through Mr. J. R. Colvin, a skin with head and horns of the Shaw deer of Thibet, proposed by Mr. Colvin, and seconded by Mr. Heatly and

Resolved that the thanks of the Society be given to Dr. Campbell for this valuable present ; and that, as recommended by the Curator, the specimen be mounted and placed in the Society's Museum.

2nd. From Captain Thuillier, Deputy Surveyor General presenting a set of the Revenue Survey Maps for the use of the Society's Library. The set comprises coloured lithographed Maps of the following districts :

*North West Provinces.*

|                      |                         |
|----------------------|-------------------------|
| Agra, .....          | } Scale 4 miles 1 inch. |
| Allahabad, .....     |                         |
| Azimgur, .....       |                         |
| Bareilly, .....      |                         |
| Benares, .....       |                         |
| Bijnour, .....       |                         |
| Bulund Shubur, ..... |                         |
| Budaon, .....        |                         |
| Cawnpore, .....      |                         |
| Delhi, .....         |                         |
| Etawah, .....        |                         |
| Furruckabad, .....   |                         |
| Ghazeepore, .....    |                         |
| Goorgaon, .....      |                         |
| Goruckpore, .....    |                         |

|                                                    |                    |
|----------------------------------------------------|--------------------|
| Map of Kumaon and British Gurhwal, .....           | } Scale 8 m. 1 in. |
| Map of the Territory of Marwar or Joodhpore, ..... |                    |
| Map of the Jeypore Territory, .....                |                    |

*Bengal Provinces.*

|                  |                         |
|------------------|-------------------------|
| Sarun, .....     | } Scale 4 miles 1 inch. |
| Behar, .....     |                         |
| Patna, .....     |                         |
| Shahabad, .....  |                         |
| Balasure, .....  |                         |
| Cuttack, .....   |                         |
| Pooree, .....    |                         |
| Midnapore, ..... |                         |
| Higillie, .....  |                         |

Surveying in India.

Ordered to be acknowledged with thanks.

5th. From Mr. J. W. Sherer, Officiating Assistant Secretary to the Government of the North West Provinces announcing the despatch of the following books presented to the Society by order of his Honor the Lieut. Governor, North West Provinces, viz. Battin's Report on Kumaon, Statistics of the North West Provinces, Statistics of Indigenous Education in the North Western Provinces, Directions to Revenue Officers.

Proposed by the Chairman, seconded by Major Baker, and unanimously

Resolved that the thanks of the Society be given to Captain Thuillier for these Maps and for his promise to present all such as may be hereafter issued from Surveyor General's Office.

3rd. From Cecil Beadon, Esq. forwarding a box containing bamboo traps for catching fish as used by the natives of Assam, also a few specimens of Machiues for cleaning and spinning cotton peculiar to the province of Assam. Mr. Beadon observes that the specimens were destined for the London Exhibition by Mr. W. N. Hudson of Mungledye in Assam, but having arrived too late for transmission to England they are in accordance with the wishes of that gentleman made over to the Museum of the Asiatic Society.

Resolved that the present be acknowledged with thanks.

4th. From Captain Thuillier presenting a copy of a Manual of Sur-

Ordered that the present be acknowledged with thanks.

6th. From M. P. J. Ondaatjee, Esq., through the Right Rev. the Lord Bishop, presenting a copy of a Memoir of Dr. Quint Ondaatjee.

Ordered that the present be thankfully acknowledged.

7th. From Rájá Rádhákánt Deb Báhádur, the last volume of his Dictionary.

Ordered that the thanks and congratulations of the Society on the completion of this valuable work be communicated to Rájá Rádhákánt Deb.

8th. The Librarian laid on the table a list of books added to the Library during the month of August last.

The name of Lieut. Faithful, proposed and seconded at the last meeting having being brought forward for ballot—

It was resolved that the election of Lieut. Faithful be reserved for determination at the next meeting, as there were not eleven ordinary members then present.

The Council submitted a Report of the expenditure on account of the Bibliotheca Indica from the year 1847, to July, 1851, together with a list of works published with reference to a resolution passed at the last meeting.

Ordered that the Report be laid on the table.

The following communications were then read :

1st. A letter from W. Seton Karr, Esq., Under Secretary to the Government of Bengal, acquainting the Society that with the permission of the Military Board the Executive Officer of Berhampore will proceed to Gour to make drawings of the architectural remains there, in December next.

Resolved that the thanks of the Society be conveyed to his Honor the Deputy Governor for this communication.

2nd. A Report on the Kurruckpore Hills, by Captain J. R. Sherwill, communicated by Captain Thuillier.

3rd. On the Dust Whirlwinds and Cyclones, by P. T. H. Baddeley, Esq. M. D., communicated by H. Piddington, Esq.

*Report of the Curator Museum of Economic Geology.*

*Economic Geology.*—Captain Haughton has sent us from Suray Rela and some other localities in the Chybassa district, four specimens of copper ore with a bit of the smelted copper and one of common iron ore. I find upon

examination that one of the copper ores (No. 4) contains a small quantity of Bismuth, but the specimen sent is too small to afford a quantitative analysis. The specimens appear to promise well, and it is remarkable that this is the spot alluded to in my recent report to Mr. Secretary Beadon, as being the locality from whence the natives gave the late Major Ouseley specimens of mere iron ores for copper.

Mr. Lonsdale of Moulmein has sent a number of ores for examination, which prove to be nothing more than different kinds of iron ore, a few having small proportions of antimony, but none of any value.

Our Secretary has received from the Hon'ble J. C. Erskine, resident at the Court of Nepal, the following letter and the specimen therein alluded to, which has been examined: the report on the specimen, follows the letter.

No. 62 of 1851.

*From the Hon'ble J. C. ERSKINE, Resident, Nepal.*

*To the Secretary to the Asiatic Society of Calcutta,*

*dated Nepal, the 14th August, 1851.*

SIR,—I have taken the liberty of forwarding to you by Dâk to-day a specimen of a mineral somewhat resembling coal. Though deficient in Carbon it appears to be a kind of lignite, and was found about five or six miles from the city of Katmandoo.

2. Would you do me the favor of obtaining from one of the members of the Asiatic Society competent to pass a judgment on such subjects, a description of this mineral, for the information of the Prime Minister General Jung Bahadoor.

I have the honor to be, Sir,

Your most obedient servant,

(Signed) J. C. ERSKINE,

*Resident, Nepal.*

*Report on a supposed specimen of lignite from Katmandoo.*

This specimen is not lignite but a very promising coal shale and considerably bituminous, as will be seen below. The impressions and remains of plants which it contains are those of *calamites*, a plant of the coal formation. The bituminous portions are distinctly seen in the cross fracture in their waving lines of dull shining coal.

Carefully dried before analysing, as all these shales absorb much moisture in the rains, 100 grains of it gave,

|                                                                                   |       |
|-----------------------------------------------------------------------------------|-------|
| Gaseous matter with water, .....                                                  | 41.50 |
| Carbon, .....                                                                     | 25.20 |
| Ash, containing a small proportion of lime but principally iron and silica, ..... | 33.30 |

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100.00

Its specific gravity was not taken, as it is of too loose a texture and we have but too small specimens of it.

(Signed) H. PIDDINGTON,

August 27th, 1851.

Curator, *Museum Economic Geology.*

Captain Sherwill has presented to the Museum small specimens of the native gold and Cinnabar of California, and Dr. Huffnagle has also presented us with a very beautiful specimen of the Auriferous Quartz from California, shewing the gold dispersed in minute spangles through the substance of the semi-transparent and opaque quartz.

I have carried on as a paper for the Journal the Table of our Examination of Indian Coals from that given by Mr. Jas. Prinsep in Vol. VII. p. 197, bringing it down to the close of Vol. XIX. for 1850; the two affording at once a full register of the Economic value of all our Indian and of some foreign coals.

We have received from Mr. Walter Elliott of the Madras Civil Service. a box of specimens collected by Lieut. Applegarth, M. N. I. near the bank of the Kistnah which it was hoped might contain organic remains indicative of coal, but there is nothing of the kind in them nor does even their lithologic character give any promise of the kind. As the excavations, however, are but superficial better success may attend farther research in more favorable spots.

H. PIDDINGTON,

Curator, *Museum Economic Geology.*

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FOR NOVEMBER, 1851.

The usual monthly meeting of the Asiatic Society was held on the evening of Wednesday the 5th November last, at half past 8 P. M.

J. R. COLVIN, Esq. Senior member of the Council present in the Chair.

The proceedings of the September meeting were read and confirmed. Donations were received—

1st. From Mr. Frederic Fitzgerald of Philadelphia. A Stone Tom-mahawk, or war hatchet, found on the Allighaney Mountains in the United States of America. Mr. Fitzgerald observes that "a withe of tough wood forms the handle of this hatchet, and that it must have been made before the discovery of America by the Europeans as iron very soon supplied the place of stone."

2nd. From D. C. Money and Rájá Ramchand Siñha. Three pieces of ancient Hindu Sculpture.

Resolved that Mr. Money and the Rájá be requested to favour the Society with an account as to the place where these interesting antiquities have been found.

From Messrs. Madden & Co. London, a copy of a History of Modern and Ancient India, by Cook Taylor.

From Mons. D. C. Wiedmann, Secretary to the Royal Academy of Sciences in Bavaria, the latest publications and transactions of the Academy.

From Captain G. Siddons, a MS. of the Vichitra Nátaka.

From the Court of Directors, a Catalogue of the Museum of the East India Company by Dr. Horsfield.

From Captain Thuillier, a very large portfolio for the district and general maps of India. This gentleman had further the goodness to arrange the maps and have them fixed in it. The special thanks of the Society were voted to the Captain.

From C. Murehead, Esq., Principal of the Grant Medical College. A report of the Grant Medical College for the Session 1850-51.

From Joseph Milligan, Esq. Secretary to the Royal Society of Van Diemen's Land.

The publications of the Royal Society of Van Diemen's Land.

With reference to Mr. Milligan's proposal for exchange of publication and specimens of Natural Products it was resolved—

That a set of the Researches as far as available and a complete set of the Journal be forwarded to the Society by an early opportunity, and that the request for exchange of specimens of Natural History be referred to the Council for report.

The Chairman stated to the meeting that Dr. O'Shaughnessy has very obligingly offered to explain the details of the Electric Telegraph now in operation between Diamond Harbour and Calcutta, to the members of the Asiatic Society, any day they may appoint between the hours of 11 A. M. to 3 P. M., and proposed that the thanks of the Society be accorded to Dr. O'Shaughnessy for his kind offer, and that the members avail themselves of the same at 11 A. M. on Saturday the 15th instant, when a special meeting of the Society will be held at the Telegraph Office, Chandpaul Ghât.

Lient. Faithful, duly proposed and seconded at the August meeting, was balloted for and elected an ordinary member.

The following gentlemen were named for ballot at the December meeting ;

Captain R. V. Thurburn ;—proposed by Dr. A. Sprenger, seconded by Mr. Colvin.

Captain Layard ;—proposed by Captain Thuillier and seconded by Captain Sherwill.

The Council communicated for the adoption of the meeting, a report by the Philological Committee on the publication of texts in the *Bibliotheca Indica*.

Report.

The Committee is of opinion—

That whilst it is of the highest importance for translations to be made here in India with all Hindu assistance, it is not expedient to limit the publication of volumes in the *Bibliotheca Indica* to works which the editors may be prepared at once to translate. It is evident that such a restriction would operate unfavorably, as in many cases, years must be spent before a perfectly satisfactory translation could be finished.

At the same time the Section recommend that no work should be printed without so much critical apparatus as is necessary for giving an account of the MSS. made use of, their authority and age, &c. and a resume of the contents of the Volume.

Also that the Ishwar Chandra Sharmana's offer to edit the *Sarbahdarshana Sangraha* be accepted.

Also that Dr. Röer having offered to publish the second part of the *Naishada* with the commentary of Mallináth,—a work which has been recommended by Professor Lassen, Dr. Röer's offer be accepted.

Proposed by Mr. Colvin, seconded by Dr. Walker and resolved that the recommendations of the Council be adopted.

Major Baker submitted for the inspection of the Society a drawing of a piece of Grecian sculpture found in Peshawur.

Bábu Rájendralál Mittra exhibited a set of electrotype impressions of the Roman gold coins lately submitted to the Society by General W. Cullen.

Notice was given by Dr. A. Sprenger that he would propose at the next meeting,

That the Museum of Natural History of the Society be offered to the Government for the formation of a Government Museum.

This proposal was referred to the Council for Report under the provisions of the Bye-laws.

Communications were received—

1st. From Mr. E. Thomas, enclosing a paper on certain ancient coins collected in Peshawur.

2nd. From Captain Thuillier, submitting an abstract of Meteorological mean annual summaries for ten years from 1841 to 1851.

From the same, forwarding a note on an inscription found in Monghyr with a drawing by Captain Layard.

From Bábu Radhanáth Sickdár, through Captain Thuillier. An account of the table used for reducing Barometrical observations to 32 Fahrenheit, in the Surveyor General's Office, Calcutta.

Resolved—that Dr. Fayerer be requested to favour the Society with such information as he may be able to obtain, regarding an inscription on the face of a rock near the Laur Thannah within ten miles of Sylhet.

LIBRARY.

The following additions have been made to the Library since August last.

Presented.

Memoir on the Statistics of Indigenous education within the North Western Provinces of the Bengal Presidency. Compiled from Official Documents under orders of the Hon'ble the Lieut.-Governor of the North Western Provinces. By R. Thornton, Esq. Calcutta, 1850. 8vo.—BY THE GOVERNMENT OF THE NORTH WESTERN PROVINCES.

Directions for Revenue Officers in the North Western Provinces. Calcutta, 1850, 8vo.—BY THE SAME.

Official Reports on the Province of Kumaon with a Medical Report on the Mohánári in Gurlwal, in 1849-50. By J. H. Batten, Esq. Agra, 1851, 8vo.—BY THE SAME.

Memoir on the Statistics of the North Western Provinces. By A. Shakespear, Esq. Calcutta, 1848, 8vo.—BY THE SAME.

Selections from the Records of the Bengal Government, No. II. Report on the Nuddia Rivers. By Capt. Lang. BY THE GOVERNMENT OF BENGAL.

A Grammar of the Panjabi language with Appendices. Lodiana, 1851, 8vo.
—BY SIR HENRY ELLIOT.

A Manual of Surveying for India. By Captains R. Smyth and H. S. Thuillier, Calcutta, 1851, 8vo.—BY CAPT. THUILLIER.

Journal of the Bombay Branch of the Royal Asiatic Society, No. XIV. Vol. VI.—BY THE SOCIETY.

33 Revenue Survey Maps of the Bengal Presidency.—BY CAPT. THUILLIER, DEPUTY SURVEYOR GENERAL.

Journal of the Ceylon Branch of the Royal Asiatic Society, No. V. for 1850.—BY THE SOCIETY.

A Brief Memoir of the Life of the late Peter Philip Jurgen Quint Ondaatjee, Colombo, 1851, 12mo. pamphlet.—BY THE COMPILER.

Brief Lectures on Mental Philosophy and other subjects; delivered in Sanskrit to the Students of the Benares Sanskrit College, Allahabad, 1845, 12mo.—BY J. MUIR, ESQ.

The Civil Auditor's Manual for the North West Provinces, by T. K. Lloyd, Esq. Calcutta, 1851, 4to.—BY THE GOVERNMENT OF THE NORTH WESTERN PROVINCES.

The Procedure of the Civil Courts of the East India Company in the Presidency of Fort William. By William McPherson, Esq. Part I. Calcutta, 1851, 4to.—BY THE AUTHOR.

The Vichetra Nátak in Punjabi. MS. 12mo.—BY CAPT. GEORGE SIDONS.

Ancient and Modern India, by the late W. Cooke Taylor: revised by P. J. Mackenna, Esq. London, 8vo. 1851.—BY MESSRS. MADDEN & CO.

Papers and Proceedings of the Royal Society of Van Diemen's Land. Vol. I. pts. I.-II.-III.—BY THE SOCIETY.

Rules of the Royal Society of Van Diemen's Land. Pamphlet.—BY THE SOCIETY.

Lexicon Geographicum cui titulus est *مصراعِد الاطلاَع على اسماء الامكنة والبقاع*. Tertius Fasciculus exhibens literas Djim-Kha. Edidit T. G. J. Juynbull. Lugduni Batavorum, 1851, 8vo.—BY THE CURATORS OF THE ACADEMY OF LEYDEN.

Life of Mohammad from original sources. By Dr. A. Sprenger. Allahábád 1851, 8vo.—BY THE AUTHOR.

Abhandlungen der kőniglich Bayrischen Akademie der Wissenschaften. Part I. of Vols. 26 and 27. By the Royal Academy of Munich.

Gelehrte Anzeigen, Vols. 30-31.—BY THE SAME.

Bulletin der kőnigl. Akademie der Wissenschaften.—Nos. 23-4.—BY THE SAME.

Ueber die politische Reformbewegung in Deutschland im XV. Jahrhunderte und den Antheil Bayerns an derselben, eine Rede gehalten an dem 91 Stiftungstage der k. bayer. Akademie der Wissenschaften zu München am 28th März, 1850, von Dr. Coost Höfler. Munich, 1850, 4to. pamphlet.

—BY THE SAME.

Einige Worte über Wallensteins Schuld Fest-Rede gelesen in der öffentlichen Sitzung der kgl. Bayr. Akademie der Wissenschaften zu München zur Feier ihres ein und neunzigsten Stiftungstages am 28th März, 1850 von Dr. Rudhart. München, 1850, 4to. pamphlet.—BY THE SAME.

Abhandlung über das Schul- und Lehr-wesen der Mohammedaner im Mittelalter, von Dr. Daniel Haneberg, Munich, 1850, 4to. pamphlet.—BY THE SAME.

Bibidhārtha Sañgraha, an illustrated Bengali periodical in the plan of the "Penny Magazine." No. I.—BY BA'BU RA'JENDRALA'L MITTRA.

Observations des Phenomènes Periodiques extraits du Tome XXV. des Memoires de l'académie Royale de Belgique, 4to.—BY THE ACADEMY.

Zeitschrift der Deutschen morgenländischen Gesellschaft. Fünfter Band, 1 Heft.—BY THE SOCIETY.

Bulletin de la Societé de Geographie Troisième série, Tome XIV.—BY THE SOCIETY.

Annual Report of the Grant Medical College, Bombay Session, 1850-51. Bombay, 1851, 8vo.—BY THE SECRETARY OF THE COLLEGE.

Journal of the Indian Archipelago, for July and August.—BY THE EDITOR.

Ditto ditto, two copies.—BY THE GOVERNMENT OF BENGAL.

Memoirs of the Royal Astronomical Society, Vol. XIX. London, 1851, 4to.—BY THE SOCIETY.

Monthly Notices of the Royal Astronomical Society containing papers, abstracts of papers, and reports of the Proceedings of the Society from November, 1849, to June, 1850, Vol. X.—BY THE SOCIETY.

Proceedings of the Royal Irish Academy, Vol. IV.—BY THE SOCIETY.

Philosophical Transactions of the Royal Society of London for 1850, part II.—BY THE SOCIETY.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for August and September, 1851.—BY THE DEPUTY SURVEYOR GENERAL.

Tattwabodhiní Patriká, Nos. 97-8-9.—BY THE TATTWABODHINI' SOBHA'.

The Oriental Baptist, Nos. 57-8-9.—BY THE EDITOR.

Calcutta Christian Observer, for September and October, 1851.—BY THE EDITORS.

The Oriental Christian Spectator, for August, September and October, 1851.—BY THE EDITOR.

The Indian Charter, Nos. 1-2-3.—BY THE EDITOR.

Upadeshak, Nos. 57-8-9.—BY THE EDITOR.

Compte Rendus de l'ouvrage de J. A. Vullers intitulé: Institutions Linguae Persicae cum Sanskrita et Zendica Lingua comparatae, Par M. Garcin de Tassy. Pamphlet.—BY THE AUTHOR.

Satyárnab, for September and October, 1851.—BY THE REV. J. LONG.

Mortality and chief diseases of the Troops under the Madras Government, European and Native, from the years 1842-46, compared with those of 1847.—BY LIEUT.-COL. W. H. SYKES.

Citizen Newspaper for September and October.—BY THE EDITOR.

Purnachandrodaya, ditto for ditto.—BY THE EDITOR.

Exchanged.

Jamieson's Journal, No. 100.

London, Edinburgh, and Dublin Philosophical Magazine, for March, April and May, 1851.

Journal Asiatique, Nos. 79-80.

Athenæum, Nos. 12-35-36-37-38-39-40-41-42.

Calcutta Review, No. 30.

Purchased.

Edinburgh Review, No. 191.

North British Review, No. 29-30.

Annals and Magazine of Natural History, Nos. 43-4-5.

Journal des Savants, May, June and July, 1851.

Comptes-Rendus, Nos. 22-3-4-5-6.

RA'JENDRALA'L MITTRA.

December 2nd, 1851.

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FOR DECEMBER, 1851.

At a meeting of the Society held on the 3rd instant, at half-past 8 P. M.

Sir JAMES COLVILE, President, in the chair.

The Proceedings of the last meeting were read and confirmed.

Donations were received—

1st. From the Government of Bengal. Nos. 3 and 4 of the Selections from the Record of the Bengal Secretariat Office.

2nd. From Dr. A. Sprenger. A copy of his new edition of the Gulistan.

Capt. Thurburn and Capt. Layard, who had been duly proposed and seconded at the last meeting, were balloted for, and elected ordinary members.

The President submitted on the part of the Council the following report with reference to the notice which Dr. Sprenger had given at the last meeting, of his intention to bring forward, at this meeting, a motion to the effect that the Museum of the Society be offered to the Government for the formation of a Government Museum, and which had been by a resolution of that meeting referred to the Council.

*Report.*

“The Council having duly considered the motion of which notice was given by Dr. Sprenger at the last General Meeting and referred to this body for its consideration, is unanimously and decidedly opposed to the proposed offer of the museum to the Government.”

Upon this, the Motion was withdrawn by Dr. Sprenger.

In conformity to a resolution of the Council, notice was given that they would propose at the approaching Annual General Meeting that the bye-Law No. 6 regarding the election of ordinary members be amended by striking out from it the word “eleven” and inserting *seven*.

Mr. Blyth read his report of progress made in the Zoological Department, during the month of November last.

The Council reported for the information of the meeting that they have granted to Mons. Garcin de Tassy, member of the French Academy, and to the Midnapore native Library, each a copy of the *Bibliotheca Indica*.

The President read an extract from a private letter from Major Kittoc requesting that the society would give to the Museum to be established at the new college at Benares, specimens of any thing Mineralogical, Entomological, Zoological, Fossil, Conchological and curiosities, of which the Society may have duplicates to spare. Referred to the Council under the bye-laws.

*Confirmed 7th January, 1852.*

*J. W. COLVILLE, President.*

*Barometrical register kept at the Surveyor General's Office, Calcutta, for the Month of September, 1851.*

| Date. | Observations made at Sun-rise. |         |         |          | Maximum Pressure observed at 9h. 50th. |                  |                     |         | Observations made at Apparent Noon. |          |                       |                |                     |         |         |          |                    |                  |
|-------|--------------------------------|---------|---------|----------|----------------------------------------|------------------|---------------------|---------|-------------------------------------|----------|-----------------------|----------------|---------------------|---------|---------|----------|--------------------|------------------|
|       | Bar. red. to 32° F.            | Or Mer. | Or Air. | W. Bulb. | Direction at Sun-rise.                 | Aspect of Sky.   | Bar. red. to 32° F. | Or Mer. | Or Air.                             | W. Bulb. | Direction at 9h. 50m. | Aspect of Sky. | Bar. red. to 32° F. | Or Mer. | Or Air. | W. Bulb. | Direction at Noon. | Aspect of Sky.   |
| 1     | 29.504                         | 81.7    | 81.9    | 80.5     | S. E.                                  | Scattered-clouds | 29.551              | 85.0    | 85.8                                | 83.2     | S. E.                 | Nimbi          | 29.532              | 86.0    | 87.0    | 83.6     | S.                 | Cloudy           |
| 2     | .539                           | 82.0    | 82.1    | 81.2     | S. E.                                  | Cumulo-strati    | .593                | 86.4    | 88.0                                | 82.8     | S. E.                 | Cumuli         | .566                | 89.6    | 90.0    | 83.0     | S. E.              | Cumulo-strati    |
| 3     | .565                           | 81.8    | 81.8    | 80.9     | S. E.                                  | Cirro-strati     | .630                | 86.5    | 87.6                                | 83.6     | S. E.                 | Cumulo-strati  | .598                | 89.0    | 90.2    | 84.0     | S.                 | Ditto            |
| 4     | .567                           | 82.0    | 82.2    | 81.4     | S. E.                                  | Raining          | .587                | 83.8    | 86.2                                | 83.8     | S. E.                 | Cumuli         | .560                | 85.3    | 89.2    | 83.8     | S. E.              | Cumuli           |
| 5     | .617                           | 81.0    | 78.0    | 76.8     | S. E.                                  | Ditto            | .621                | 81.2    | 82.2                                | 80.3     | E.                    | Cloudy         | .629                | 84.2    | 85.3    | 81.4     | S.                 | Scattered-clouds |
| 6     | .575                           | 80.3    | 80.6    | 80.0     | S. E.                                  | Cloudy           | .666                | 84.3    | 85.4                                | 82.7     | S. E.                 | Cumulo-strati  | .647                | 87.2    | 87.8    | 82.8     | S. E.              | Cumulo-strati    |
| 7     | .558                           | 82.9    | 82.9    | 81.8     | S. W.                                  | Cirro-strati     | .575                | 87.0    | 87.5                                | 82.8     | E.                    | Ditto          | .557                | 89.8    | 90.3    | 83.4     | E.                 | Ditto            |
| 8     | .466                           | 82.8    | 82.8    | 81.8     | N. E.                                  | Cirro-cumuli     | .525                | 86.9    | 86.2                                | 82.4     | N.                    | Cirro-cumuli   | .470                | 90.2    | 91.2    | 82.4     | E.                 | Ditto            |
| 9     | .495                           | 82.0    | 82.1    | 80.6     | E.                                     | Cumuli           | .573                | 86.5    | 87.4                                | 82.4     | E.                    | Cloudy         | .544                | 85.9    | 85.5    | 82.3     | E.                 | Ditto            |
| 10    | .547                           | 81.2    | 81.3    | 80.0     | E.                                     | Ditto            | .592                | 86.2    | 87.2                                | 81.4     | S. E.                 | Cumuli         | .542                | 89.0    | 90.5    | 83.3     | E.                 | Ditto            |
| 11    | .526                           | 82.8    | 83.0    | 82.0     | W.                                     | Cloudy           | .594                | 84.4    | 84.8                                | 81.3     | N. E.                 | Cloudy         | .569                | 85.0    | 85.0    | 82.0     | N.                 | Cloudy           |
| 12    | .612                           | 79.2    | 79.2    | 78.2     | S. E.                                  | Raining          | .693                | 82.8    | 82.6                                | 80.2     | S. S. W.              | Ditto          | .657                | 89.8    | 80.6    | 79.4     | S.                 | Drizzly          |
| 13    | .674                           | 80.4    | 80.6    | 79.6     | S. W.                                  | Cirro-cumuli     | .709                | 85.4    | 86.3                                | 82.0     | S. S. W.              | Cumulo-strati  | .673                | 88.5    | 89.0    | 82.3     | S. S. W.           | Cumulo-strati    |
| 14    | .663                           | 82.0    | 82.2    | 80.0     | S.                                     | Cirro-strati     | .729                | 86.2    | 87.9                                | 82.5     | S. W.                 | Ditto          | .696                | 89.0    | 89.9    | 82.8     | S. W.              | Ditto            |
| 15    | .680                           | 82.0    | 82.2    | 81.0     | S.                                     | Scattered-clouds | .741                | 85.5    | 86.0                                | 81.3     | S. S. W.              | Ditto          | .708                | 86.8    | 87.3    | 82.2     | S. W.              | Ditto            |
| 16    | .688                           | 81.8    | 82.0    | 80.4     | S. W.                                  | Cirro-cumuli     | .761                | 86.2    | 87.7                                | 82.2     | S. W.                 | Ditto          | .713                | 89.0    | 90.0    | 82.4     | W.                 | Ditto            |
| 17    | .712                           | 82.6    | 82.8    | 81.4     | S. S. W.                               | Ditto            | .777                | 87.0    | 87.8                                | 79.8     | W. N. W.              | Cirro-cumuli   | .734                | 89.2    | 91.0    | 82.8     | W. S. W.           | Ditto            |
| 18    | .725                           | 83.2    | 83.6    | 82.4     | S. S. W.                               | Cumuli           | .776                | 85.2    | 84.0                                | 81.2     | N.                    | Raining        | .762                | 87.0    | 87.3    | 81.7     | N. W.              | Ditto            |
| 19    | .756                           | 81.3    | 81.6    | 80.6     | E.                                     | Cirro-strati     | .796                | 85.2    | 84.0                                | 81.2     | N.                    | Raining        | .786                | 89.4    | 90.1    | 82.4     | S. E.              | Cumuli           |
| 20    | .729                           | 80.2    | 80.4    | 78.6     | E. N. E.                               | Ditto            | .786                | 86.4    | 83.3                                | 80.4     | N.                    | Cumuli         | .756                | 85.0    | 84.0    | 80.0     | E.                 | Cumulo-strati    |
| 21    | .743                           | 83.0    | 83.3    | 81.6     | S. E.                                  | Scattered-clouds | .797                | 87.3    | 88.4                                | 82.3     | S. E.                 | Cumulo-strati  | .786                | 89.4    | 90.1    | 82.4     | N. W.              | Cumuli           |
| 22    | .771                           | 82.8    | 83.2    | 81.7     | W.                                     | Cloudy           | .837                | 86.5    | 88.0                                | 82.8     | W. N. W.              | Cirro-cumuli   | .786                | 89.4    | 90.1    | 82.4     | N. W.              | Cumuli           |
| 23    | .761                           | 82.8    | 82.7    | 80.4     | S. W.                                  | Cirro-cumuli     | .823                | 87.3    | 89.0                                | 81.2     | W. S. W.              | Ditto          | .772                | 90.9    | 92.4    | 82.4     | W.                 | Ditto            |
| 24    | .761                           | 83.2    | 83.5    | 82.2     | S. W.                                  | Ditto            | .798                | 88.2    | 89.3                                | 82.2     | S. W.                 | Cumulo-strati  | .802                | 90.2    | 91.0    | 84.2     | W. N. W.           | Ditto            |
| 25    | .803                           | 83.7    | 84.2    | 82.7     | S. S. E.                               | Ditto            | .852                | 87.6    | 88.6                                | 83.6     | S. W.                 | Cirro-cumuli   | .843                | 90.3    | 91.0    | 81.3     | E. N. E.           | Cumuli           |
| 26    | .832                           | 81.6    | 81.6    | 80.2     | S. S. E.                               | Cirro-strati     | .887                | 87.3    | 88.8                                | 82.2     | N.                    | Cumuli         | .776                | 90.0    | 89.8    | 80.3     | E.                 | Ditto            |
| 27    | .773                           | 83.0    | 83.3    | 81.2     | N.                                     | Cumuli           | .831                | 88.0    | 88.3                                | 80.8     | E.                    | Ditto          | .724                | 89.7    | 90.4    | 81.6     | N. E.              | Cumulo-strati    |
| 28    | .723                           | 81.0    | 81.0    | 79.5     | N. E.                                  | Clear            | .775                | 86.6    | 87.8                                | 80.3     | E.                    | Ditto          | .715                | 89.0    | 90.0    | 81.4     | E.                 | Ditto            |
| 29    | .693                           | 80.0    | 80.2    | 79.0     | N. E.                                  | Cirro-strati     | .752                | 85.6    | 86.7                                | 80.9     | E.                    | Ditto          | .739                | 89.0    | 90.0    | 80.6     | S. E.              | Ditto            |
| 30    | .745                           | 80.0    | 80.6    | 79.3     | S. E.                                  | Ditto            | .779                | 86.2    | 87.2                                | 81.2     | S. E.                 | Cumulo-strati  |                     |         |         |          |                    |                  |
| Mean  | 29.662                         | 81.8    | 81.9    | 80.6     | ....                                   | .....            | 29.714              | 86.0    | 87.0                                | 81.9     | ....                  | .....          | 29.678              | 88.3    | 88.9    | 82.2     | ....               | .....            |

# [ Meteorological Register, continued. ]

| Observations made at 2hs, 40m. |              |         |          |                            |                 |                     |              |         |          | Minimum Pressure observed at 4 p. m. |                |                     |              |         |          |                            |                 |      |       | Observations made at sun-set. |                            |              |              |       |  |  |  |  |  | Maximum and Minimum Thermometer. |  |  |  | Rain Gauges. |  | Moon's Phase. |  |
|--------------------------------|--------------|---------|----------|----------------------------|-----------------|---------------------|--------------|---------|----------|--------------------------------------|----------------|---------------------|--------------|---------|----------|----------------------------|-----------------|------|-------|-------------------------------|----------------------------|--------------|--------------|-------|--|--|--|--|--|----------------------------------|--|--|--|--------------|--|---------------|--|
| Bar. red. to 32° F.            | Temperature. |         |          | Wind. Direction at 2h 40m. | Aspect of Sky.  | Bar. red. to 32° F. | Temperature. |         |          | Wind. Direction at 4 p. m.           | Aspect of Sky. | Bar. red. to 32° F. | Temperature. |         |          | Wind. Direction at Sunset. | Aspect of Sky.  | Max. | Mean. | Min.                          | Max. Therm. in Sun's rays. | Elevations.  |              | Date. |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
|                                | OF Mer.      | OF Air. | W. Bulb. |                            |                 |                     | OF Mer.      | OF Air. | W. Bulb. |                                      |                |                     | OF Mer.      | OF Air. | W. Bulb. |                            |                 |      |       |                               |                            | Feet. Upper. | Feet. Lower. |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| 29.640                         | 87.2         | 86.8    | 83.0     | S.                         | Scatter'd clds. | 29.466              | 86.8         | 86.3    | 82.4     | S. E.                                | Cloudy         | 29.483              | 85.0         | 84.1    | 81.5     | S. E.                      | Cloudy          | 88.0 | 84.4  | 80.8                          | 98.4                       | 0.060        | 1            |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .502                           | 90.4         | 90.6    | 83.0     | S. E.                      | Cumulo-strati   | .481                | 90.8         | 91.2    | 83.2     | S. E.                                | Cirro-strati   | .516                | 89.2         | 88.0    | 81.2     | S.                         | Cirro-strati    | 91.4 | 86.5  | 81.9                          | 107.0                      | 0.22         | 2            |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .532                           | 88.4         | 88.5    | 84.2     | S. E.                      | Cloudy          | .507                | 88.2         | 88.2    | 83.0     | S.                                   | Ditto          | .524                | 88.5         | 87.9    | 83.5     | S.                         | Ditto           | 91.0 | 86.0  | 80.9                          | 107.0                      | 0.330        | 3            |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .485                           | 90.8         | 90.6    | 84.2     | S. E.                      | Cumulo-strati   | .491                | 89.0         | 88.2    | 84.8     | S.                                   | Cloudy         | .520                | 86.1         | 85.3    | 82.0     | S. S. W.                   | Cloudy          | 91.8 | 86.3  | 80.7                          | 106.6                      | 2.660        | 4            |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .554                           | 86.6         | 86.7    | 83.3     | S.                         | Cumuli          | .545                | 87.2         | 86.6    | 82.4     | S. S. W.                             | Ditto          | .568                | 85.3         | 85.3    | 82.8     | S. S. W.                   | Cirro-strati    | 88.3 | 83.0  | 77.7                          | 107.8                      | 0.370        | 5            |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .571                           | 87.2         | 87.8    | 83.3     | S.                         | Nimbi           | .547                | 87.8         | 88.8    | 84.4     | S.                                   | Cumulo-strati  | .557                | 86.3         | 86.0    | 83.0     | S.                         | Ditto           | 89.0 | 84.2  | 79.4                          | 102.0                      | 0.100        | 6            |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .471                           | 91.9         | 93.0    | 83.5     | S. E.                      | Cumulo-strati   | .453                | 88.0         | 86.0    | 83.1     | S.                                   | Ditto          | .475                | 85.8         | 85.3    | 82.4     | S.                         | Ditto           | 92.8 | 87.2  | 81.6                          | 112.7                      | ..           | 7            |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .406                           | 92.4         | 93.0    | 83.3     | E.                         | Ditto           | .403                | 91.0         | 89.7    | 82.4     | S. E.                                | Cloudy         | .427                | 85.7         | 85.3    | 81.8     | E. S. E.                   | Scattered-clds. | 93.3 | 87.8  | 82.2                          | 110.2                      | 0.120        | 8            |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .478                           | 86.4         | 87.5    | 83.4     | E.                         | Ditto           | .476                | 86.4         | 85.3    | 81.2     | S. E.                                | Cumulo-strati  | .496                | 86.3         | 86.0    | 81.0     | S. E.                      | Ditto           | 88.0 | 84.7  | 81.4                          | 99.8                       | 0.220        | 9            |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .495                           | 89.4         | 88.2    | 82.3     | E. S. E.                   | Cloudy          | .483                | 89.4         | 90.4    | 81.2     | E.                                   | Cirro-strati   | .481                | 87.3         | 87.9    | 83.0     | E. S. E.                   | Cirro-strati    | 90.7 | 85.5  | 80.2                          | 108.8                      | 0.105        | 10           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .516                           | 79.6         | 79.2    | 78.2     | S.                         | Raining         | .514                | 80.8         | 81.3    | 79.2     | S. W.                                | Cirro-strati   | .539                | 81.2         | 81.0    | 78.9     | S.                         | Cloudy          | 85.8 | 84.0  | 82.2                          | 90.0                       | 1.975        | 11           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .607                           | 81.0         | 80.8    | 79.6     | S. S. W.                   | Ditto           | .595                | 81.2         | 81.8    | 80.8     | S. S. W.                             | Cloudy         | .611                | 81.7         | 81.9    | 80.3     | S.                         | Ditto           | 83.7 | 81.0  | 78.2                          | 88.0                       | 0.030        | 12           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .614                           | 89.0         | 88.7    | 83.0     | S.                         | Cumulo-strati   | .604                | 87.4         | 86.2    | 81.7     | S. W.                                | Ditto          | .625                | 84.2         | 84.9    | 80.0     | S. W.                      | Ditto           | 90.2 | 85.0  | 79.8                          | 101.7                      | ..           | 13           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .625                           | 90.2         | 90.3    | 82.5     | S.                         | Ditto           | .617                | 90.2         | 90.0    | 82.0     | S.                                   | Cumulo-strati  | .639                | 86.0         | 85.8    | 81.4     | S.                         | Scattered-clds. | 91.2 | 86.3  | 81.4                          | 104.8                      | ..           | 14           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .643                           | 89.4         | 89.8    | 83.4     | S. W.                      | Ditto           | .642                | 90.0         | 88.8    | 82.5     | S.                                   | Ditto          | .663                | 86.0         | 86.0    | 81.3     | S.                         | Cumulo-strati   | 92.2 | 86.4  | 81.5                          | 107.6                      | ..           | 15           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .662                           | 91.0         | 91.4    | 82.6     | W.                         | Ditto           | .648                | 91.6         | 92.0    | 83.2     | W.                                   | Ditto          | .681                | 87.0         | 86.2    | 81.6     | S.                         | Scattered-clds. | 92.3 | 86.8  | 80.4                          | 103.8                      | ..           | 16           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .683                           | 90.6         | 90.6    | 81.4     | W.                         | Ditto           | .676                | 90.4         | 89.6    | 81.0     | S. W.                                | Cloudy         | .679                | 87.0         | 86.2    | 82.1     | W.                         | Cumuli          | 92.0 | 87.1  | 82.2                          | 106.3                      | ..           | 17           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .678                           | 83.7         | 87.2    | 82.4     | S.                         | Cloudy          | .673                | 86.6         | 86.0    | 80.4     | E. N. E.                             | Ditto          | .695                | 84.2         | 84.1    | 79.5     | S. E.                      | Cloudy          | 91.8 | 87.3  | 82.8                          | 105.6                      | 0.205        | 18           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .676                           | 90.4         | 91.8    | 82.0     | N. E.                      | Cumulo-strati   | .654                | 91.2         | 91.7    | 81.4     | N. W.                                | Cumulo-strati  | .692                | 85.2         | 83.9    | 79.8     | S. E.                      | Cumulo-strati   | 91.8 | 86.3  | 80.8                          | 109.8                      | ..           | 19           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .666                           | 92.0         | 92.0    | 80.8     | S. E.                      | Ditto           | .664                | 91.0         | 89.8    | 82.6     | N. E.                                | Ditto          | .692                | 85.1         | 83.5    | 80.0     | S. E.                      | Cloudy          | 92.7 | 86.2  | 79.7                          | 112.0                      | ..           | 20           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .688                           | 87.3         | 87.3    | 82.0     | N. E.                      | Cloudy          | .681                | 86.8         | 86.0    | 81.2     | N.                                   | Cloudy         | .728                | 85.0         | 84.4    | 81.8     | S. S. E.                   | Ditto           | 88.7 | 85.8  | 82.8                          | 97.0                       | ..           | 21           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .710                           | 92.3         | 92.3    | 82.0     | N. W.                      | Cumulo-strati   | .692                | 91.8         | 91.0    | 82.3     | N. W.                                | Cumulo-strati  | .728                | 88.0         | 87.4    | 81.7     | S. E.                      | Scattered-clds. | 93.3 | 87.7  | 82.0                          | 106.8                      | 0.140        | 22           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .710                           | 92.4         | 93.0    | 81.8     | N.                         | Ditto           | .692                | 93.0         | 93.3    | 81.2     | N. W.                                | Clear          | .704                | 90.3         | 89.0    | 81.7     | N.                         | Cirro-strati    | 93.3 | 87.7  | 82.0                          | 112.5                      | ..           | 23           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .699                           | 93.4         | 93.5    | 82.3     | W.                         | Ditto           | .688                | 93.8         | 94.2    | 83.0     | S. W.                                | Cumulo-strati  | .713                | 91.5         | 90.0    | 83.2     | W.                         | Ditto           | 94.8 | 88.7  | 82.6                          | 106.4                      | ..           | 24           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .756                           | 87.3         | 84.0    | 78.5     | S. E.                      | Raining         | .746                | 84.3         | 83.8    | 79.3     | E. N. E.                             | Cloudy         | .766                | 84.0         | 84.2    | 79.0     | E. S. E.                   | Cloudy          | 91.7 | 87.5  | 83.2                          | 107.0                      | ..           | 25           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .767                           | 91.4         | 91.6    | 81.3     | E.                         | Cumulo-strati   | .747                | 92.0         | 92.0    | 82.0     | E. S. E.                             | Cirro-strati   | .760                | 89.8         | 89.4    | 82.7     | S.                         | Cirro-strati    | 92.6 | 86.7  | 80.7                          | 107.7                      | ..           | 26           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .696                           | 90.2         | 90.0    | 81.0     | N. E.                      | Ditto           | .691                | 90.2         | 90.0    | 80.4     | E.                                   | Cloudy         | .716                | 87.5         | 87.1    | 80.2     | E.                         | Ditto           | 91.0 | 86.8  | 82.6                          | 105.7                      | ..           | 27           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .676                           | 85.6         | 81.0    | 79.0     | S. E.                      | Raining         | .683                | 81.7         | 81.4    | 79.2     | N.                                   | Raining        | .677                | 81.6         | 81.4    | 79.0     | E.                         | Cloudy          | 91.7 | 86.0  | 80.2                          | 108.0                      | 0.305        | 28           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .646                           | 91.0         | 90.6    | 80.7     | N.                         | Nimbi           | .661                | 87.0         | 84.8    | 80.3     | S.                                   | Cloudy         | .662                | 81.8         | 82.0    | 79.7     | S. W.                      | Cirro-strati    | 91.6 | 85.4  | 79.2                          | 109.3                      | 0.665        | 29           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| .644                           | 91.3         | 91.5    | 80.6     | S. E.                      | Cumuli          | .625                | 91.4         | 91.4    | 80.2     | E. S. E.                             | Cirro-strati   | .645                | 89.5         | 88.4    | 82.2     | S. S. W.                   | Ditto           | 91.9 | 85.8  | 79.6                          | 111.5                      | ..           | 30           |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |
| 29.617                         | 89.2         | 89.0    | 82.0     | ....                       | ....            | 29.601              | 83.6         | 88.2    | 81.7     | ....                                 | ....           | 29.623              | 86.1         | 85.6    | 81.3     | ....                       | ....            | 90.9 | 86.0  | 81.0                          | 105.4                      | 7.505        | 8.49         |       |  |  |  |  |  |                                  |  |  |  |              |  |               |  |

*Micro-meteorological register kept at the Surveyor General's Office, Calcutta, for the Month of October, 1851.*

| Date. | Observations made at Sun-rise. |         |         |          | Maximum Pressure observed at 9h. 50m. |                  |                     |         | Observations made at Apparent Noon. |          |                             |                |                     |         |         |          |                          |                |
|-------|--------------------------------|---------|---------|----------|---------------------------------------|------------------|---------------------|---------|-------------------------------------|----------|-----------------------------|----------------|---------------------|---------|---------|----------|--------------------------|----------------|
|       | Bar. red. to 32° F.            | Of Mer. | Of Air. | W. Bulb. | Wind. Direction at Sun-rise.          | Aspect of Sky.   | Bar. red. to 32° F. | Of Mer. | Of Air.                             | W. Bulb. | Wind. Direction at 9h. 50m. | Aspect of Sky. | Bar. red. to 32° F. | Of Mer. | Of Air. | W. Bulb. | Wind. Direction at Noon. | Aspect of Sky. |
| 1     | Inches 29.703                  | 82.4    | 82.8    | 81.4     | S. W.                                 | Cloudy           | Inches 29.732       | 86.3    | 86.6                                | 82.0     | S. W.                       | Cirro-cumuli   | 29.706              | 90.3    | 91.2    | 81.3     | S. E.                    | Cirro-cumuli   |
| 2     | .738                           | 81.8    | 82.3    | 81.0     | S.                                    | Cirro-strati     | .791                | 87.6    | 88.7                                | 82.0     | S.                          | Cumulo-strati  | .752                | 90.4    | 90.4    | 81.6     | S. E.                    | Cumulo-strati  |
| 3     | .771                           | 82.3    | 82.6    | 81.4     | S. N.                                 | Cumuli           | .815                | 86.6    | 86.8                                | 81.5     | S. W.                       | Ditto          | .741                | 89.6    | 89.0    | 82.0     | S. W.                    | Ditto          |
| 4     | .690                           | 81.4    | 81.7    | 79.0     | N.                                    | Cirro-strati     | .735                | 85.4    | 86.0                                | 80.8     | N. N. W.                    | Ditto          | .660                | 89.0    | 90.7    | 82.7     | N. N. W.                 | Ditto          |
| 5     | .625                           | 77.4    | 77.4    | 75.9     | S. S. E.                              | Cloudy           | .674                | 79.0    | 80.2                                | 77.4     | N. E.                       | Cloudy         | .605                | 84.3    | 85.2    | 80.4     | N. E.                    | Ditto          |
| 6     | .662                           | 78.3    | 78.3    | 77.6     | S. S. E.                              | Raining          | .746                | 79.4    | 79.8                                | 78.4     | S. S. E.                    | Drizzly        | .713                | 83.2    | 84.0    | 79.6     | S. E.                    | Nimbi          |
| 7     | .798                           | 78.2    | 78.2    | 77.6     | S. E.                                 | Cloudy           | .857                | 82.7    | 83.6                                | 80.6     | E. S. E.                    | Cloudy         | .819                | 85.2    | 85.2    | 80.4     | S. E.                    | Cloudy         |
| 8     | .804                           | 78.2    | 78.0    | 76.5     | S. E.                                 | Scattered-clouds | .861                | 84.3    | 84.3                                | 79.6     | E. S. E.                    | Cumulo-strati  | .804                | 85.0    | 83.6    | 80.2     | E. S. E.                 | Nimbi          |
| 9     | .795                           | 79.0    | 79.2    | 78.3     | S.                                    | Drizzly          | .841                | 85.0    | 85.6                                | 80.4     | S.                          | Ditto          | .801                | 85.4    | 86.7    | 81.2     | S.                       | Cumulo-strati  |
| 10    | .835                           | 79.0    | 79.0    | 78.0     | S. E.                                 | Cumulo-strati    | .880                | 83.6    | 84.3                                | 80.3     | S. S. W.                    | Cumuli         | .836                | 86.0    | 86.0    | 80.4     | S. S. W.                 | Nimbi          |
| 11    | .871                           | 78.4    | 78.6    | 78.0     | S.                                    | Cumuli           | .910                | 84.7    | 86.0                                | 80.2     | S. E.                       | Cumulo-strati  | .859                | 87.4    | 88.4    | 81.4     | S. S. W.                 | Cumulo-strati  |
| 12    | .823                           | 79.0    | 79.3    | 78.4     | S. E.                                 | Clear            | .871                | 85.3    | 86.6                                | 81.2     | S. E.                       | Ditto          | .818                | 86.7    | 86.6    | 81.3     | S. W.                    | Ditto          |
| 13    | .724                           | 79.0    | 79.2    | 78.0     | S. E.                                 | Ditto            | .804                | 84.0    | 84.4                                | 79.5     | N. W.                       | Ditto          | .750                | 87.0    | 87.0    | 79.6     | E.                       | Ditto          |
| 14    | .724                           | 78.8    | 79.0    | 78.4     | E.                                    | Ditto            | .787                | 85.0    | 86.4                                | 80.9     | E. S. E.                    | Ditto          | .749                | 87.6    | 88.0    | 81.0     | E. S. E.                 | Ditto          |
| 15    | .814                           | 79.4    | 79.6    | 79.2     | S. S. E.                              | Generally-clear  | .877                | 85.0    | 86.8                                | 81.6     | S. S. E.                    | Ditto          | .832                | 85.8    | 83.8    | 79.4     | S. S. E.                 | Raining        |
| 16    | .858                           | 79.4    | 79.6    | 78.7     | S.                                    | Clear            | .917                | 84.3    | 85.2                                | 79.3     | S. W.                       | Cumuli         | .884                | 86.7    | 88.0    | 80.9     | S. W.                    | Cumuli         |
| 17    | .878                           | 79.4    | 79.5    | 78.4     | S. S. E.                              | Ditto            | .916                | 85.3    | 87.0                                | 79.9     | S. W.                       | Cumulo-strati  | .889                | 86.6    | 86.6    | 80.3     | S. W.                    | Cumulo-strati  |
| 18    | .854                           | 79.5    | 79.8    | 78.8     | S. E.                                 | Cirro-strati     | .922                | 83.3    | 83.6                                | 79.0     | N. E.                       | Ditto          | .851                | 88.9    | 89.4    | 80.0     | N. E.                    | Ditto          |
| 19    | .868                           | 78.2    | 78.3    | 77.3     | N. E.                                 | Scattered-clouds | .884                | 80.2    | 80.6                                | 76.5     | E. N. E.                    | Ditto          | .863                | 85.0    | 85.6    | 79.3     | E. N. E.                 | Ditto          |
| 20    | .849                           | 77.4    | 77.4    | 75.8     | N. E.                                 | Cloudy           | .822                | 83.3    | 83.6                                | 79.0     | E. N. E.                    | Ditto          | .819                | 82.4    | 82.6    | 78.0     | N. E.                    | Cloudy         |
| 21    | .777                           | 77.0    | 76.6    | 75.6     | N. E.                                 | Drizzly          | .819                | 80.6    | 81.3                                | 78.5     | N. E.                       | Cloudy         | .776                | 81.7    | 77.8    | 75.7     | S. E.                    | Raining        |
| 22    | .752                           | 76.4    | 76.8    | 76.0     | N. E.                                 | Cloudy           | .806                | 78.0    | 78.7                                | 77.4     | N. E.                       | Ditto          | .765                | 77.0    | 75.5    | 74.0     | N. E.                    | Raining        |
| 23    | .564                           | 76.2    | 76.0    | 75.3     | N. E.                                 | Raining          | .520                | 75.4    | 76.0                                | 75.2     | N. E.                       | Raining        | .475                | 76.4    | 76.6    | 75.3     | N.                       | Ditto          |
| 24    | .705                           | 75.4    | 75.6    | 74.4     | N. W.                                 | Cloudy           | .771                | 79.0    | 80.0                                | 76.3     | W.                          | Cumulo-strati  | .730                | 81.8    | 83.0    | 78.0     | W.                       | Cumulo-strati  |
| 25    | .791                           | 77.6    | 77.8    | 77.3     | S.                                    | Clear            | .863                | 82.7    | 84.3                                | 77.3     | S.                          | Clear          | .819                | 85.3    | 86.2    | 76.8     | W.                       | Clear          |
| 26    | .905                           | 75.4    | 75.7    | 75.2     | S. S. W.                              | Ditto            | .955                | 81.8    | 83.8                                | 79.0     | S.                          | Ditto          | .919                | 84.9    | 85.9    | 79.9     | S. W.                    | Ditto          |
| 27    | .989                           | 75.0    | 75.4    | 74.5     | W. S. W.                              | Ditto            | 30.044              | 81.4    | 82.8                                | 75.6     | S. W.                       | Ditto          | 30.001              | 84.0    | 85.0    | 76.2     | S. S. W.                 | Ditto          |
| 28    | 30.031                         | 73.7    | 74.0    | 72.8     | S. W.                                 | Ditto            | .066                | 79.7    | 81.2                                | 72.0     | W.                          | Ditto          | .012                | 83.0    | 83.3    | 74.0     | S. W.                    | Ditto          |
| 29    | 29.995                         | 72.0    | 72.3    | 70.7     | S. S. E.                              | Ditto            | .042                | 80.5    | 81.8                                | 73.7     | S. S. W.                    | Ditto          | 29.990              | 83.5    | 84.3    | 70.7     | S. S. W.                 | Ditto          |
| 30    | .999                           | 73.0    | 73.0    | 71.5     | S.                                    | Ditto            | .045                | 80.0    | 81.3                                | 72.9     | S. E.                       | Ditto          | 30.000              | 83.0    | 83.9    | 73.4     | S. E.                    | Ditto          |
| 31    | 30.018                         | 70.5    | 70.4    | 68.8     | N.                                    | Ditto            | .075                | 76.7    | 78.0                                | 73.2     | N. E.                       | Ditto          | .030                | 80.6    | 81.7    | 74.2     | S.                       | Cumuli         |
| Mean  | 29.810                         | 77.7    | 77.8    | 76.8     | .....                                 | .....            | 29.863              | 82.5    | 83.5                                | 78.5     | .....                       | .....          | 29.815              | 84.9    | 85.2    | 78.7     | .....                    | .....          |

# [ Meteorological Register, continued. ]

| Observations made at 2h. 40m. |         |              |      | Minimum Pressure observed at 4 p. m. |                            |                     |         | Observations made at sun-set. |      |                |                            | Maximum and Minimum Thermometer. |         |         |          | Rain Gauges. |       | Moons Phases. |                            |             |       |       |
|-------------------------------|---------|--------------|------|--------------------------------------|----------------------------|---------------------|---------|-------------------------------|------|----------------|----------------------------|----------------------------------|---------|---------|----------|--------------|-------|---------------|----------------------------|-------------|-------|-------|
| Bar. red. to 32° F.           | Of Mer. | Temperature. |      | Aspect of Sky.                       | Wind. Direction at 4 p. m. | Bar. red. to 32° F. | Of Mer. | Temperature.                  |      | Aspect of Sky. | Wind. Direction at Sunset. | Bar. red. to 32° F.              | Of Mer. | Of Air. | Of Bulb. | Max.         | Mean. | Min.          | Max. Therm. in Sun's Rays. | Elevations. |       | Date. |
|                               |         | Inches       | °    |                                      |                            |                     |         | Inches                        | °    |                |                            |                                  |         |         |          |              |       |               |                            | Upper       | Lower |       |
| 29.670                        | 91.8    | 92.0         | 82.2 | S. W.                                | Cirro-cumuli               | 29.674              | 87.4    | 86.0                          | 80.2 | S.             | Cirro-cumuli               | 29.674                           | 87.4    | 86.0    | 80.2     | 92.5         | 87.4  | 82.2          | 107.5                      | ..          | ..    | 1     |
| .671                          | 91.4    | 91.5         | 82.6 | S.                                   | Cumulo-strati              | .700                | 88.6    | 87.9                          | 82.4 | S.             | Cirro-strati               | .700                             | 88.6    | 87.9    | 82.4     | 92.6         | 87.3  | 82.0          | 106.8                      | ..          | ..    | 2     |
| .684                          | 91.0    | 91.4         | 82.4 | S. W.                                | Ditto                      | .681                | 86.7    | 86.0                          | 81.3 | N. E.          | Ditto                      | .681                             | 86.7    | 86.0    | 81.3     | 92.6         | 86.7  | 82.0          | 106.8                      | ..          | ..    | 3     |
| .584                          | 90.4    | 91.4         | 82.4 | N. W.                                | Ditto                      | .586                | 89.0    | 88.3                          | 82.3 | N.N.W.         | Ditto                      | .586                             | 89.0    | 88.3    | 82.3     | 92.2         | 86.6  | 81.0          | 105.2                      | 1.00        | ..    | 4     |
| .535                          | 85.0    | 84.0         | 79.2 | N. E.                                | Ditto                      | .546                | 82.3    | 81.8                          | 78.4 | N.             | Cloudy                     | .546                             | 82.3    | 81.8    | 78.4     | 86.9         | 80.9  | 74.8          | 104.8                      | 1.05        | ..    | 5     |
| .666                          | 81.5    | 81.7         | 78.3 | S. E.                                | Ditto                      | .696                | 81.4    | 81.5                          | 78.8 | S. E.          | Ditto                      | .696                             | 81.4    | 81.5    | 78.8     | 84.7         | 81.0  | 77.2          | 91.3                       | 0.490       | ..    | 6     |
| .748                          | 84.0    | 84.2         | 80.6 | S. E.                                | Raining                    | .726                | 83.8    | 83.3                          | 80.2 | S. E.          | Raining                    | .726                             | 83.8    | 83.3    | 80.2     | 86.3         | 81.8  | 77.2          | 97.7                       | 0.065       | ..    | 7     |
| .738                          | 87.0    | 86.4         | 80.6 | S.                                   | Cloudy                     | .772                | 85.0    | 84.3                          | 80.2 | S.             | Scattered-clds.            | .772                             | 85.0    | 84.3    | 80.2     | 88.2         | 82.5  | 76.8          | 103.6                      | 0.27        | ..    | 8     |
| .742                          | 86.8    | 87.6         | 81.3 | S.                                   | Cumulo-strati              | .802                | 82.3    | 82.0                          | 79.7 | S.             | Cirro-strati               | .802                             | 82.3    | 82.0    | 79.7     | 88.4         | 83.3  | 78.2          | 105.8                      | 0.245       | ..    | 9     |
| .793                          | 81.6    | 81.4         | 78.4 | S.                                   | Ditto                      | .808                | 83.3    | 83.2                          | 80.8 | S. E.          | Cumuli                     | .808                             | 83.3    | 83.2    | 80.8     | 86.8         | 82.4  | 78.0          | 101.4                      | 0.155       | ..    | 10    |
| .812                          | 81.8    | 82.8         | 80.2 | S.                                   | Cloudy                     | .729                | 85.4    | 84.8                          | 80.8 | S. E.          | Cumulo-strati              | .729                             | 85.4    | 84.8    | 80.8     | 89.0         | 83.5  | 77.9          | 106.2                      | 0.225       | ..    | 11    |
| .733                          | 89.2    | 88.2         | 80.7 | S.                                   | Cumulo-strati              | .692                | 84.5    | 84.0                          | 80.2 | S.             | Cirro-strati               | .692                             | 84.5    | 84.0    | 80.2     | 90.0         | 84.1  | 78.2          | 105.8                      | ..          | ..    | 12    |
| .682                          | 84.3    | 84.4         | 80.7 | N. E.                                | Cirro-cumuli               | .736                | 80.4    | 80.7                          | 79.4 | S. E.          | Ditto                      | .736                             | 80.4    | 80.7    | 79.4     | 88.6         | 83.4  | 78.1          | 101.4                      | 0.495       | ..    | 13    |
| .713                          | 83.3    | 84.6         | 80.6 | S.                                   | Cumulo-strati              | .799                | 86.0    | 85.0                          | 80.8 | S.             | Raining                    | .799                             | 86.0    | 85.0    | 80.8     | 88.5         | 83.6  | 78.7          | 107.4                      | ..          | ..    | 14    |
| .784                          | 85.2    | 85.8         | 81.8 | S.                                   | Cumulo-strati              | .812                | 86.2    | 85.6                          | 78.2 | S. E.          | Cumulo-strati              | .812                             | 86.2    | 85.6    | 78.2     | 89.8         | 84.2  | 78.6          | 104.3                      | ..          | ..    | 15    |
| .813                          | 89.0    | 88.9         | 81.2 | S. W.                                | Cumuli                     | .712                | 82.0    | 79.5                          | 77.3 | S. W.          | Clear                      | .712                             | 82.0    | 79.5    | 77.3     | 88.5         | 83.6  | 78.7          | 107.4                      | ..          | ..    | 16    |
| .786                          | 89.4    | 90.0         | 80.4 | S.                                   | Cumulo-strati              | .782                | 90.0    | 90.0                          | 80.3 | S. W.          | Ditto                      | .782                             | 90.0    | 90.0    | 80.3     | 89.5         | 87.5  | 86.6          | 107.4                      | ..          | ..    | 17    |
| .807                          | 84.5    | 78.8         | 76.3 | S. E.                                | Raining                    | .791                | 83.2    | 82.5                          | 78.8 | S. W.          | Cirro-strati               | .791                             | 83.2    | 82.5    | 78.8     | 80.8         | 82.0  | 81.4          | 108.3                      | 0.310       | ..    | 18    |
| .798                          | 83.3    | 84.0         | 79.0 | N. E.                                | Cumulo-strati              | .806                | 82.2    | 82.2                          | 78.6 | N. E.          | Cloudy                     | .806                             | 82.2    | 82.2    | 78.6     | 831          | 80.0  | 79.0          | 103.2                      | 0.105       | ..    | 19    |
| .855                          | 81.4    | 79.0         | 77.0 | N. E.                                | Raining                    | .751                | 80.0    | 79.2                          | 77.4 | S. E.          | Ditto                      | .751                             | 80.0    | 79.2    | 77.4     | 759          | 79.0  | 78.6          | 99.6                       | 0.820       | ..    | 20    |
| .719                          | 78.0    | 78.5         | 77.0 | E.S.E.                               | Cloudy                     | .710                | 79.3    | 80.0                          | 77.8 | E.S.E.         | Ditto                      | .710                             | 79.3    | 80.0    | 77.8     | .722         | 79.2  | 79.0          | 94.6                       | 0.625       | ..    | 21    |
| .692                          | 75.0    | 75.3         | 74.7 | N. E.                                | Raining                    | .667                | 75.5    | 76.2                          | 75.3 | N. E.          | Drizzly                    | .667                             | 75.5    | 76.2    | 75.3     | .663         | 75.6  | 75.2          | 94.6                       | 0.70        | ..    | 22    |
| .488                          | 77.2    | 78.0         | 75.8 | N.                                   | Cloudy                     | .515                | 77.5    | 77.6                          | 75.7 | N. E.          | Raining                    | .515                             | 77.5    | 77.6    | 75.7     | .663         | 75.6  | 75.2          | 94.6                       | over the    | ..    | 23    |
| .662                          | 85.2    | 86.0         | 78.5 | W.                                   | Cumuli                     | .668                | 85.6    | 85.8                          | 78.2 | N. W.          | Cumulo-strati              | .668                             | 85.6    | 85.8    | 78.2     | .555         | 77.8  | 78.0          | 98.5                       | 0.085       | ..    | 24    |
| .774                          | 87.2    | 87.4         | 76.4 | S. W.                                | Clear                      | .764                | 87.0    | 86.3                          | 78.0 | S. W.          | Clear                      | .764                             | 87.0    | 86.3    | 78.0     | .679         | 84.6  | 83.8          | 98.5                       | ..          | ..    | 25    |
| .860                          | 86.8    | 87.4         | 78.0 | SS.W.                                | Ditto                      | .866                | 86.7    | 85.3                          | 77.4 | S. W.          | Ditto                      | .866                             | 86.7    | 85.3    | 77.4     | .812         | 84.8  | 83.8          | 105.2                      | ..          | ..    | 26    |
| .947                          | 86.5    | 86.6         | 76.6 | W.                                   | Ditto                      | .947                | 86.3    | 86.0                          | 76.2 | S. W.          | Ditto                      | .947                             | 86.3    | 86.0    | 76.2     | .893         | 84.5  | 82.9          | 103.3                      | ..          | ..    | 27    |
| .943                          | 85.8    | 85.9         | 71.7 | S. W.                                | Ditto                      | .944                | 85.6    | 84.8                          | 72.8 | S. W.          | Ditto                      | .944                             | 85.6    | 84.8    | 72.8     | .914         | 82.0  | 81.8          | 102.7                      | ..          | ..    | 28    |
| .933                          | 85.6    | 85.8         | 75.4 | S. W.                                | Ditto                      | .921                | 85.0    | 84.5                          | 73.6 | S. W.          | Ditto                      | .921                             | 85.0    | 84.5    | 73.6     | .924         | 83.2  | 82.1          | 104.0                      | ..          | ..    | 29    |
| .925                          | 85.3    | 85.2         | 73.4 | S.                                   | Ditto                      | .929                | 85.0    | 84.0                          | 73.0 | S.S.E.         | Ditto                      | .929                             | 85.0    | 84.0    | 73.0     | .944         | 83.2  | 82.1          | 101.7                      | ..          | ..    | 30    |
| .967                          | 84.2    | 84.6         | 75.2 | W.                                   | Cumuli                     | .968                | 84.3    | 83.3                          | 74.0 | N.N.E.         | Ditto                      | .968                             | 84.3    | 83.3    | 74.0     | .983         | 82.6  | 82.3          | 98.7                       | ..          | ..    | 31    |



Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of November, 1851.

| Date. | Observations made at Sun-rise. |         |         |          |                              | Maximum Pressure observed at 9 h. 50 m. |               |         |         |          | Observations made at Apparent Noon. |                |               |         |         |          |                          |                |
|-------|--------------------------------|---------|---------|----------|------------------------------|-----------------------------------------|---------------|---------|---------|----------|-------------------------------------|----------------|---------------|---------|---------|----------|--------------------------|----------------|
|       | Bar. red. to                   | Of Mer. | Of Air. | W. Bulb. | Wind. Direction at Sun-rise. | Aspect of Sky.                          | Bar. red. to  | Of Mer. | Of Air. | W. Bulb. | Wind. Direction at 50m.             | Aspect of Sky. | Bar. red. to  | Of Mer. | Of Air. | W. Bulb. | Wind. Direction at Noon. | Aspect of Sky. |
| 1     | Inches 30.039                  | 72.0    | 72.0    | 70.2     | N. E.                        | Clear                                   | Inches 30.008 | 83.2    | 84.7    | 74.4     | N.                                  | Clear          | Inches 30.008 | 83.2    | 84.7    | 74.4     | N. N. E.                 | Clear          |
| 2S.   | .037                           | 72.6    | 72.8    | 70.4     | N. E.                        | Cirro-strati                            | .067          | 80.2    | 81.6    | 73.0     | F.                                  | Cirro-strati   | .094          | 83.6    | 84.6    | 73.0     | N. N. E.                 | Cirro-strati   |
| 3     | 29.938                         | 74.3    | 74.5    | 71.4     | N.                           | Cirro-cumuli                            | 29.979        | 79.0    | 80.5    | 75.0     | N.                                  | Cirro-cumuli   | 29.927        | 81.3    | 81.3    | 74.3     | N. N. W.                 | Cirro-cumuli   |
| 4     | .879                           | 73.3    | 73.0    | 70.0     | N.                           | Cirro-strati                            | .908          | 79.4    | 80.8    | 71.5     | N.                                  | Cirro-strati   | .854          | 83.2    | 83.8    | 72.0     | N. N. W.                 | Cirro-strati   |
| 5     | .913                           | 71.6    | 71.5    | 68.4     | N.                           | Ditto                                   | .961          | 79.0    | 80.8    | 71.5     | N.                                  | Clear          | .879          | 83.0    | 84.0    | 71.7     | N. N. W.                 | Clear          |
| 6     | .900                           | 70.4    | 70.0    | 67.0     | N.                           | Ditto                                   | .940          | 76.4    | 78.2    | 70.9     | N. N. E.                            | Cirro-strati   | .804          | 81.4    | 82.2    | 72.2     | N. N. W.                 | Cirro-strati   |
| 7     | .900                           | 70.4    | 70.2    | 67.0     | N.                           | Ditto                                   | .952          | 77.6    | 79.2    | 70.2     | N.                                  | Ditto          | .879          | 81.4    | 82.2    | 72.2     | N. N. W.                 | Ditto          |
| 8     | .874                           | 70.4    | 72.6    | 69.0     | N. N. E.                     | Ditto                                   | .924          | 78.6    | 80.4    | 71.3     | N.                                  | Ditto          | .885          | 80.6    | 82.0    | 70.4     | N. N. W.                 | Ditto          |
| 9S.   | .916                           | 71.0    | 71.2    | 68.4     | N.                           | Ditto                                   | .964          | 76.3    | 77.4    | 71.4     | N. N. W.                            | Ditto          | .901          | 81.4    | 82.0    | 72.8     | N. N. W.                 | Clear          |
| 10    | .957                           | 71.3    | 71.2    | 68.2     | N.                           | Cirro-cumuli                            | 30.019        | 77.3    | 79.2    | 70.8     | N. N. E.                            | Cirro-cumuli   | .976          | 81.5    | 82.5    | 72.8     | N. N. W.                 | Ditto          |
| 11    | .960                           | 71.0    | 70.5    | 67.8     | N.                           | Clear                                   | .014          | 76.3    | 77.9    | 69.6     | N. N. E.                            | Cirro-cumuli   | .959          | 80.3    | 82.0    | 70.0     | N. N. W.                 | Ditto          |
| 12    | .916                           | 70.8    | 70.7    | 68.3     | N.                           | Ditto                                   | 29.967        | 78.3    | 80.4    | 69.9     | N.                                  | Ditto          | .915          | 81.4    | 83.4    | 70.6     | N. N. W.                 | Ditto          |
| 13    | .945                           | 69.8    | 70.0    | 67.8     | N.                           | Ditto                                   | .997          | 77.3    | 79.2    | 70.0     | N. N. W.                            | Ditto          | .945          | 81.0    | 82.8    | 71.6     | N. N. W.                 | Ditto          |
| 14    | .981                           | 65.4    | 65.4    | 62.8     | N.                           | Ditto                                   | 30.010        | 73.3    | 75.2    | 65.0     | N. N. W.                            | Ditto          | .953          | 77.6    | 79.2    | 65.3     | N. N. W.                 | Cirro-strati   |
| 15    | .975                           | 64.3    | 64.6    | 63.0     | Calm                         | Cirro-strati                            | .027          | 72.0    | 75.4    | 66.4     | N.                                  | Cirro-strati   | .968          | 77.0    | 78.4    | 66.4     | E.                       | Ditto          |
| 16S.  | .960                           | 65.0    | 65.0    | 63.8     | Calm                         | Clear                                   | 29.989        | 73.2    | 75.8    | 67.0     | N. N. W.                            | Clear          | .937          | 77.5    | 79.9    | 68.8     | N. N. E.                 | Clear          |
| 17    | .925                           | 67.0    | 67.2    | 65.8     | Calm                         | Cirro-strati                            | .963          | 75.0    | 77.2    | 71.2     | N.                                  | Ditto          | .908          | 80.2    | 82.3    | 72.3     | N. N. E.                 | Clear          |
| 18    | .942                           | 71.2    | 71.2    | 69.2     | E.                           | Cirro-cumuli                            | .988          | 77.2    | 79.0    | 71.7     | N. N. E.                            | Cirro-cumuli   | .939          | 81.2    | 82.2    | 73.2     | N. N. E.                 | Cirro-cumuli   |
| 19    | 30.011                         | 67.6    | 67.4    | 63.4     | N. E.                        | Clear                                   | 30.060        | 75.4    | 78.0    | 66.5     | N. N. E.                            | Clear          | 30.060        | 81.0    | 83.0    | 69.8     | N. N. E.                 | Clear          |
| 20    | 29.982                         | 65.0    | 65.2    | 62.4     | N.                           | Ditto                                   | .031          | 72.0    | 73.9    | 66.8     | N. N. W.                            | Ditto          | 29.968        | 77.2    | 79.2    | 69.2     | N. N. W.                 | Ditto          |
| 21    | .961                           | 67.6    | 67.6    | 65.0     | N. N. W.                     | Cirro-cumuli                            | .007          | 72.8    | 74.5    | 65.4     | N. N. W.                            | Ditto          | .951          | 77.4    | 79.2    | 67.0     | N. N. W.                 | Ditto          |
| 22    | .899                           | 68.5    | 68.3    | 67.3     | N. N. W.                     | Foggy                                   | 29.947        | 74.4    | 76.5    | 69.3     | N. N. W.                            | Ditto          | .879          | 79.0    | 80.2    | 69.7     | N. N. W.                 | Ditto          |
| 23S.  | .831                           | 67.9    | 68.0    | 66.3     | S. W.                        | Cirro-cumuli                            | .879          | 75.5    | 78.5    | 70.5     | S.                                  | Ditto          | .821          | 80.5    | 82.4    | 70.6     | S.                       | Ditto          |
| 24    | .896                           | 72.7    | 73.2    | 72.4     | S.                           | Foggy                                   | .954          | 75.4    | 76.6    | 74.5     | N. N. W.                            | Hazy           | .906          | 80.3    | 82.4    | 75.6     | N. N. W.                 | Cumuli         |
| 25    | .950                           | 68.2    | 67.8    | 63.8     | N. N. W.                     | Clear                                   | 30.021        | 73.6    | 75.4    | 67.0     | N.                                  | Clear          | .957          | 77.5    | 79.0    | 68.0     | N. N. W.                 | Clear          |
| 26    | .989                           | 66.0    | 65.9    | 62.8     | N. N. W.                     | Cumuli                                  | .053          | 71.3    | 72.5    | 65.0     | N.                                  | Ditto          | .990          | 76.4    | 77.8    | 68.2     | N. N. W.                 | Cumuli         |
| 27    | .999                           | 65.4    | 65.0    | 61.3     | N. N. W.                     | Ditto                                   | .038          | 71.2    | 73.2    | 65.0     | N.                                  | Ditto          | .980          | 76.8    | 78.5    | 69.5     | N.                       | Clear          |
| 28    | .965                           | 66.0    | 65.2    | 61.4     | N. N. W.                     | Cirro-strati                            | .021          | 71.3    | 73.6    | 65.8     | N.                                  | Ditto          | .969          | 77.4    | 79.8    | 70.2     | N.                       | Ditto          |
| 29    | .979                           | 67.0    | 66.5    | 62.2     | N. N. W.                     | Clear                                   | .039          | 71.8    | 74.3    | 66.2     | N.                                  | Ditto          | .987          | 78.0    | 80.3    | 70.2     | N.                       | Ditto          |
| 30S.  | 30.008                         | 69.5    | 69.5    | 63.4     | N.                           | Cloudy                                  | .066          | 71.1    | 71.9    | 65.5     | N.                                  | Cloudy         | 30.007        | 73.6    | 75.9    | 67.9     | N. N. W.                 | Cloudy         |
| Mean  | 29.947                         | 69.2    | 69.1    | 66.3     | .....                        | .....                                   | 29.995        | 75.4    | 77.3    | 69.3     | .....                               | .....          | 29.939        | 79.7    | 81.0    | 70.7     | .....                    | .....          |

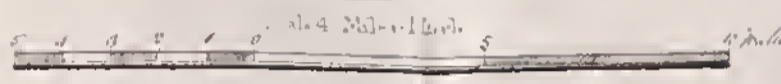


*Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of December, 1851.*

| Date. | Observations made at Sun-rise. |         |         |          | Maximum Pressure observed at 9 h. 50 m. |                 |                     |         | Observations made at Apparent Noon. |          |                      |                |                     |         |         |          |                    |                |
|-------|--------------------------------|---------|---------|----------|-----------------------------------------|-----------------|---------------------|---------|-------------------------------------|----------|----------------------|----------------|---------------------|---------|---------|----------|--------------------|----------------|
|       | Bar. red. to 32° F.            | Of Mer. | Of Air. | W. Bulb. | Direction at Sun-rise.                  | Aspect of Sky.  | Bar. red. to 32° F. | Of Mer. | Of Air.                             | W. Bulb. | Direction at 9h 50m. | Aspect of Sky. | Bar. red. to 32° F. | Of Mer. | Of Air. | W. Bulb. | Direction at Noon. | Aspect of Sky. |
| 1     | 29.988                         | 65.6    | 65.4    | 62.8     | N.                                      | Clear           | 30.043              | 72.0    | 74.2                                | 67.5     | N.                   | Clear          | 29.986              | 77.0    | 78.6    | 67.2     | N. N. W.           | Clear          |
| 2     | .964                           | 62.9    | 62.9    | 60.2     | N. N. W.                                | Ditto           | .083                | 70.0    | 72.2                                | 65.3     | N. N. W.             | Ditto          | .972                | 75.6    | 77.6    | 66.0     | N. N. W.           | Ditto          |
| 3     | 30.007                         | 64.0    | 63.9    | 61.2     | N.                                      | Ditto           | .088                | 71.2    | 73.3                                | 65.4     | N.                   | Ditto          | .999                | 76.0    | 77.8    | 66.2     | N. N. W.           | Cirro-strati   |
| 4     | 29.988                         | 63.3    | 62.6    | 59.6     | N. N. W.                                | Ditto           | .083                | 68.5    | 70.4                                | 62.4     | N. W.                | Ditto          | 30.029              | 73.2    | 75.2    | 62.9     | N. N. W.           | Clear          |
| 5     | 30.029                         | 59.4    | 59.0    | 56.3     | N.                                      | Ditto           | .085                | 65.5    | 67.6                                | 58.0     | N.                   | Ditto          | .021                | 72.0    | 73.4    | 58.3     | N. N. W.           | Ditto          |
| 6     | .041                           | 55.0    | 55.2    | 53.4     | Calm                                    | Ditto           | .113                | 63.2    | 65.9                                | 56.0     | N. W.                | Ditto          | .055                | 70.2    | 72.2    | 59.2     | N. W.              | Ditto          |
| 7 S.  | .067                           | 55.6    | 55.2    | 53.0     | Calm                                    | Ditto           | .114                | 63.5    | 66.4                                | 59.2     | N. W.                | Ditto          | .050                | 69.5    | 71.4    | 60.0     | N. W.              | Ditto          |
| 8     | .009                           | 56.8    | 56.2    | 53.4     | N. W.                                   | Ditto           | .059                | 63.0    | 65.3                                | 57.7     | N. W.                | Ditto          | .050                | 69.5    | 71.4    | 60.0     | N. W.              | Ditto          |
| 9     | 29.992                         | 57.0    | 56.4    | 53.4     | Calm                                    | Ditto           | .056                | 63.4    | 66.0                                | 57.4     | W.                   | Ditto          | 29.987              | 70.0    | 72.8    | 62.5     | N. W.              | Ditto          |
| 10    | 30.056                         | 56.0    | 55.8    | 53.4     | Calm                                    | Ditto           | .124                | 63.5    | 66.2                                | 58.0     | N. W.                | Ditto          | .997                | 70.2    | 72.5    | 60.6     | N. W.              | Ditto          |
| 11    | .100                           | 58.3    | 57.6    | 54.4     | N. N. W.                                | Ditto           | .147                | 64.6    | 67.4                                | 58.4     | N.                   | Ditto          | 30.066              | 71.0    | 73.0    | 59.9     | N. N. W.           | Ditto          |
| 12    | .083                           | 56.8    | 56.5    | 53.4     | N. N. W.                                | Ditto           | .138                | 63.4    | 66.0                                | 57.8     | N. N. W.             | Ditto          | .092                | 71.0    | 73.4    | 61.3     | N. N. W.           | Ditto          |
| 13    | .091                           | 57.6    | 57.6    | 55.4     | W.                                      | Cirro-strati    | .126                | 65.6    | 69.0                                | 62.8     | N.                   | Ditto          | .084                | 70.2    | 74.0    | 61.8     | N. N. W.           | Ditto          |
| 14 S. | .079                           | 61.2    | 61.0    | 58.4     | Calm                                    | Ditto           | .129                | 68.8    | 72.2                                | 64.6     | N.                   | Ditto          | .077                | 72.7    | 75.0    | 65.4     | W. N. W.           | Ditto          |
| 15    | .048                           | 61.5    | 61.0    | 59.6     | Calm                                    | Clear           | .107                | 69.0    | 71.4                                | 64.2     | N.                   | Ditto          | .059                | 74.8    | 77.0    | 66.3     | N.                 | Ditto          |
| 16    | .041                           | 61.0    | 61.0    | 59.8     | Calm                                    | Ditto           | .088                | 68.0    | 70.4                                | 64.3     | N. N. W.             | Ditto          | .048                | 73.7    | 75.6    | 65.8     | N.                 | Ditto          |
| 17    | .025                           | 61.7    | 61.8    | 60.4     | Calm                                    | Ditto           | .084                | 70.0    | 73.0                                | 64.6     | N. N. W.             | Ditto          | .026                | 74.0    | 76.2    | 66.2     | N. W.              | Ditto          |
| 18    | .041                           | 65.3    | 65.4    | 64.8     | Calm                                    | Foggy           | .088                | 69.3    | 72.3                                | 68.3     | W. S. W.             | Ditto          | .027                | 75.2    | 77.3    | 67.4     | N. W.              | Ditto          |
| 19    | .004                           | 63.6    | 63.7    | 62.4     | Calm                                    | Clear           | .048                | 70.4    | 73.4                                | 68.8     | S. W.                | Cumuli         | .023                | 75.0    | 76.9    | 69.0     | W.                 | Cumulo-strati  |
| 20    | .026                           | 62.6    | 62.8    | 61.2     | Calm                                    | Ditto           | .097                | 69.0    | 71.8                                | 65.2     | N. E.                | Clear          | .013                | 75.0    | 77.0    | 69.4     | W.                 | Cumulo-strati  |
| 21 S. | .049                           | 62.5    | 62.7    | 61.2     | Calm                                    | Ditto           | .102                | 70.2    | 72.8                                | 65.1     | N. N. W.             | Clear          | .043                | 75.0    | 77.4    | 67.3     | N. N. E.           | Cumuli         |
| 22    | .031                           | 64.0    | 64.2    | 63.2     | N. W.                                   | Cumuli          | .078                | 70.2    | 72.3                                | 67.8     | N. W.                | Clear          | .022                | 75.4    | 77.5    | 67.2     | S. W.              | Ditto          |
| 23    | .020                           | 65.5    | 65.2    | 64.6     | Calm                                    | Foggy           | .088                | 67.8    | 69.9                                | 67.3     | N.                   | Ditto          | .040                | 74.2    | 76.6    | 65.4     | N. W.              | Clear          |
| 24    | .030                           | 62.7    | 62.4    | 61.3     | W. N. W.                                | Fogs and Cirro- | .074                | 68.0    | 70.2                                | 63.2     | W.                   | Cirro-strati   | .016                | 73.4    | 74.6    | 62.0     | W.                 | Cirro-strati   |
| 25    | .033                           | 60.4    | 60.5    | 57.3     | N. W.                                   | Clear           | .092                | 67.0    | 69.3                                | 61.6     | N. W.                | Clear          | .036                | 74.6    | 76.6    | 62.8     | N. N. W.           | Clear          |
| 26    | .073                           | 59.5    | 59.2    | 57.3     | N.                                      | Ditto           | .118                | 67.3    | 70.2                                | 63.4     | N. W.                | Ditto          | .054                | 73.2    | 75.2    | 63.7     | N. W.              | Ditto          |
| 27    | .017                           | 58.0    | 58.0    | 56.6     | Calm                                    | Ditto           | .065                | 66.0    | 68.8                                | 59.5     | N. E.                | Ditto          | .009                | 72.0    | 74.2    | 62.6     | W. N. W.           | Ditto          |
| 28 S. | .028                           | 58.3    | 58.0    | 57.0     | Calm                                    | Ditto           | .068                | 66.4    | 69.4                                | 62.0     | N. E.                | Ditto          | .009                | 72.0    | 74.0    | 62.4     | N. N. W.           | Ditto          |
| 29    | .047                           | 56.4    | 56.6    | 54.8     | Calm                                    | Foggy           | .117                | 64.4    | 68.2                                | 58.4     | E. S. E.             | Ditto          | .056                | 73.0    | 75.4    | 63.5     | N. W.              | Ditto          |
| 30    | .075                           | 57.7    | 57.6    | 56.0     | Calm                                    | Clear           | .115                | 66.0    | 69.4                                | 62.0     | W.                   | Ditto          | .046                | 72.4    | 75.0    | 63.4     | N. W.              | Ditto          |
| 31    | .033                           | 58.0    | 58.2    | 56.5     | Calm                                    | Ditto           | .072                | 67.3    | 70.0                                | 61.0     | E. N. E.             | Ditto          | .014                | 72.4    | 75.0    | 64.0     | N. N. W.           | Ditto          |
| Mean  | 30.036                         | 60.3    | 60.1    | 58.1     | ....                                    | .....           | 30.091              | 67.2    | 69.8                                | 62.5     | ....                 | .....          | 30.032              | 73.2    | 75.3    | 64.1     | ....               | .....          |



MAP  
OF THE  
**DAMINI-KOH**  
OR  
**RAJMAHAL HILLS**  
DISTRICT BHAUGULPOOR  
Surveyed in 1848-50  
1851  
CAPTAIN W. S. SHERWILL  
Revenue Surveyor



Drawn for the Journal of the  
Survey of Bengal  
between December 1851  
*W. S. Sherwill* Captain  
Revenue Surveyor

GANGES RIVER  
Chutpoca - Karagoda Ghat

COLOONO

TEEL GURHI  
MUNINARI

BHAUGULPOOR

PURSA

MOTEEA

GODDA

PUSSYE

GODDA

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FURUCKABAD

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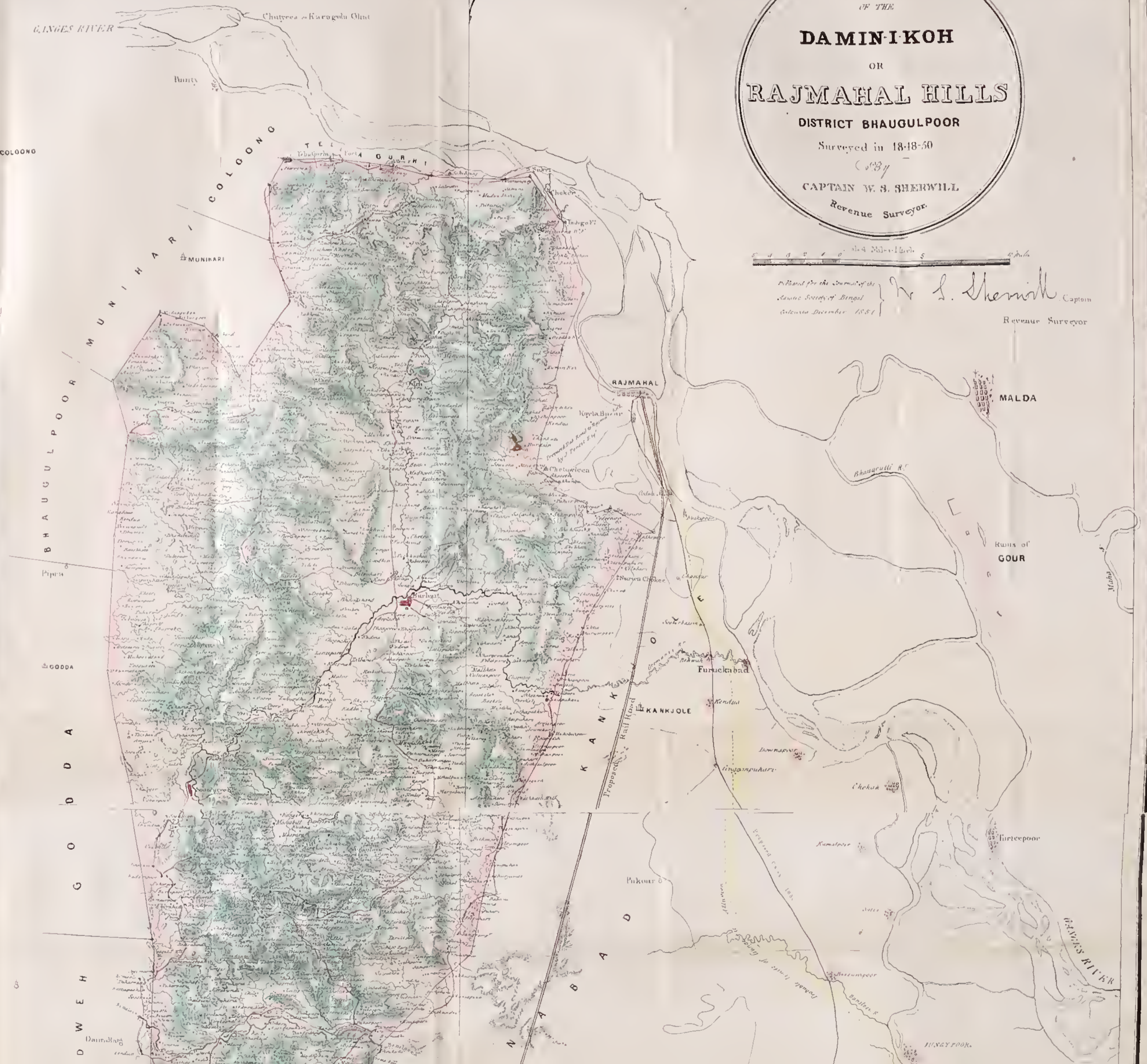
LONGAPUR

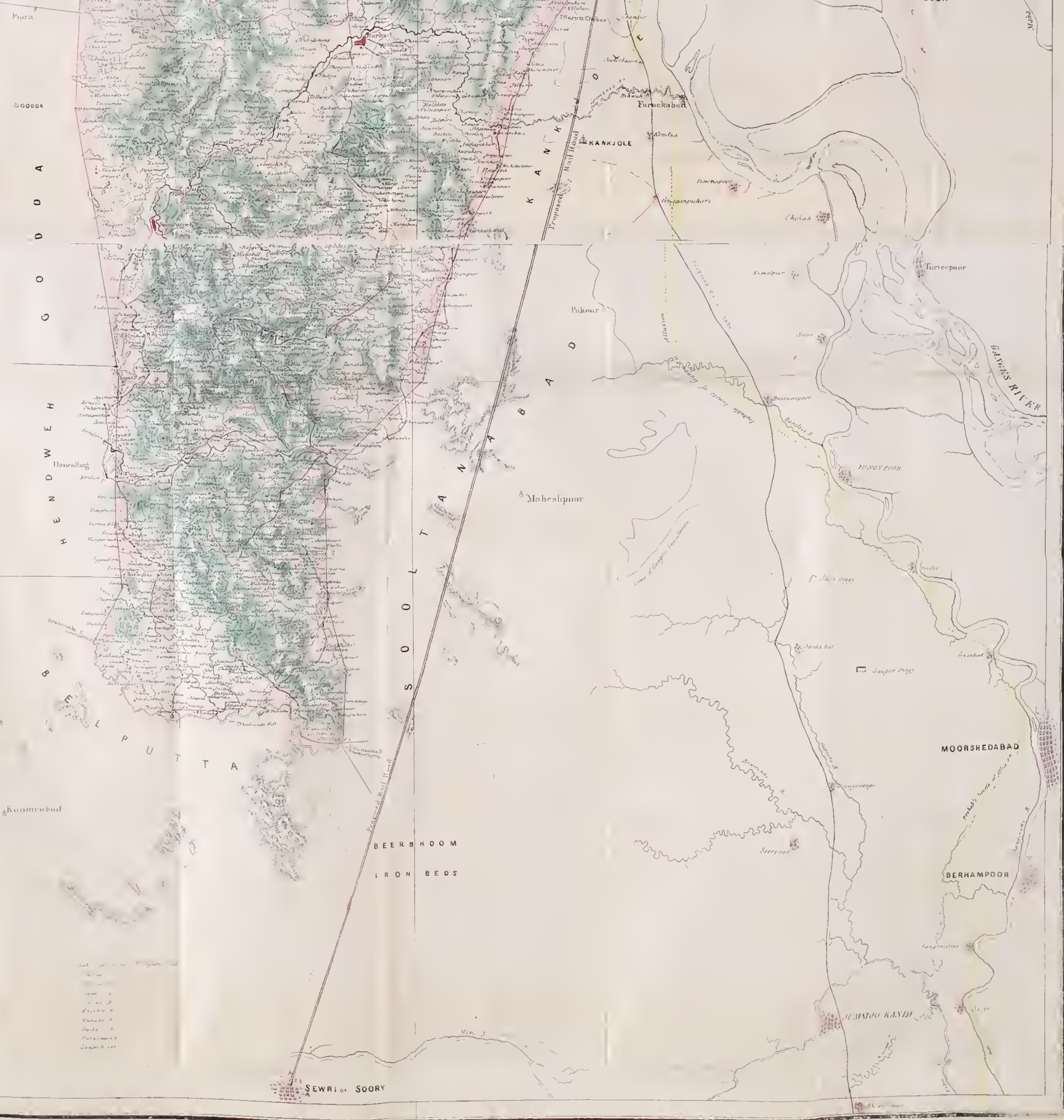
KAMALPUR

FIRTEEPUR

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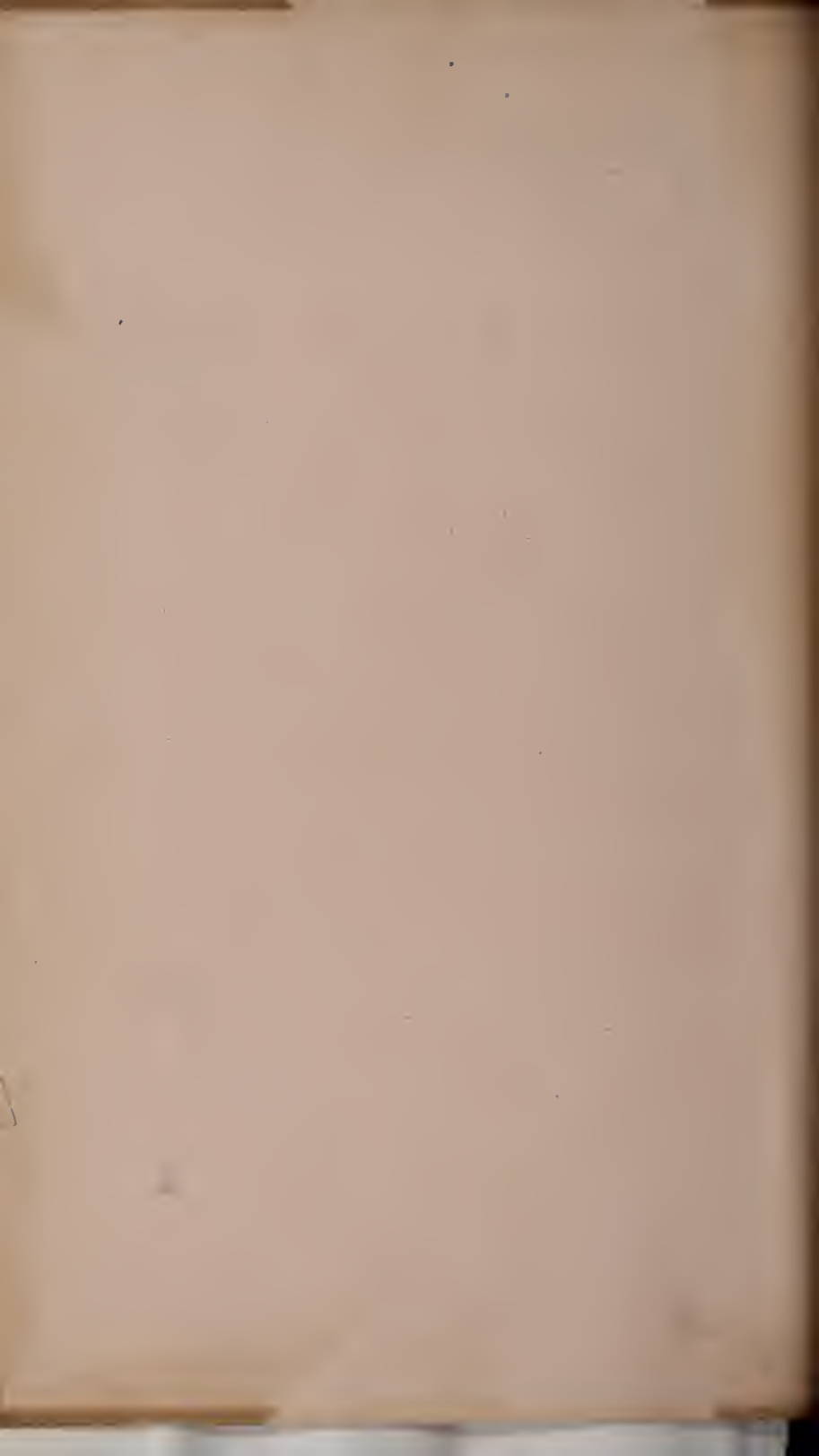
BERHAMPOOR

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